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Battelle Technical Review

IN THIS ISSUE:

Ceramic-Coated Metals for Industry

ENGINEERING ECONOMIST

LEO C. BAILEY

"Technical excellence of equipment, processes, and products is not enough to assure success to a company in today's competitive economy. In the last analysis, profit, the real measure of a company's success, depends upon the ability of a business organization to sell its products and services. The fine work of the technologist may be lost if what he has done fails to get to the consumer."

These are the observations of Leo C. Bailey of Battelle's engineering economics division. The investigation of distribution and marketing problems is his province. Trained in both science and economics, Leo has discovered that he has the same aims as his technological colleagues on the Institute staff—to make recommendations, based on assembled data, that will help executives reach sound decisions. He has also found that the backing of engineers and scientists on his research team aids him in doing a more effective job of solving his engineering economic problems.

Since joining Battelle in 1950, Leo has tackled problems of many types. He and his colleagues have improved the profit position of companies by correcting faulty distribution methods, uncovering new markets for established products, and determining qualities in products to make them more salable. He has participated in studies of problems of materials supply to discover if adequate sources were available for planned production and has helped to find new uses and markets for raw materials in excess supply.

Leo's career in engineering economics developed naturally from his interest in the economics of minerals. After receiving his B.S. degree in geology from The Ohio State University in 1948, he turned to the study of business problems. Leo received a master's degree in business administration from Stanford Graduate School of Business in 1950. During the same year he participated in a broad plant-location study carried on at The Ohio State University.

In his private life, Leo shares his spare time with his family, just increased to four. He is also busy completing his new home, a project on which he has done much of the work.

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***Asterisks mark items that may be used in the Battelle Library only. None of the unbound materials listed below are available for interlibrary loan.**

AERONAUTICAL ENGINEERING

4301 Flight Measurements of Trailing-Edge Suction on a Sailplane. August Raspet and Glenn D. Bryant. *Aeronautical Engineering Review*, v. 13, Jan. 1954, p. 26-36.

Investigation made on a sailplane equipped with trailing-edge suction slot that covers two-thirds of the wing span. Diagrams, graphs, photographs. 7 ref.

4302* The Normal Modes of Vibration of an Aircraft. N. P. Shevloff and T. J. Reid. *Aircraft Engineering*, v. 25, Dec. 1953, p. 360-366.

Presents a mathematical analysis. Table. 12 ref.

4303* Transient Thermal Stresses in Wings. E. W. Parkes. *Aircraft Engineering*, v. 25, Dec. 1953, p. 373-378.

Includes diagrams, tables, graphs. 6 ref.

4304 Rockets Behind the Iron Curtain. George P. Sutton. *Automotive Industries*, v. 110, Jan. 1, 1954, p. 68-72, 110, 112.

A discussion of Russian progress in rocket propulsion. Tables, map, diagrams.

4305 U. S. Unveils Defensive Missile System. *Aviation Week*, v. 59, Dec. 28, 1953, p. 13-14.

Army Nike rocket rides radar beam to target. Range is only 18 miles from site of launching. Photographs.

4306 Mach 2 Problem. Violet Controls. Robert Hotz. *Aviation Week*, v. 59, Dec. 28, 1953, p. 15-16.

X-1A's 1,650-m.p.h. flight confirms need for substantial reserach before new 1,000-m.p.h. aircraft are designed. Photographs.

4307 A Guide to High-Altitude Rocket Design. *Aviation Week*, v. 59, Dec. 28, 1953, p. 28-31.

Based on "Structural Design Considerations for a High-Altitude Sounding Rocket of the Viking Type", Richard C. Lea. Presented at the 8th annual convention of the American Rocket Society, Dec. 2-4, 1953. Photographs.

4308 Designing Radomes for Supersonic Speeds. Samuel S. Oleesky. *Electronics*, v. 27, Jan. 1954, p. 130-135.

Describes radome design problems and use of honeycomb, foam, and sandwich materials as definite solutions. Photographs, graphs, diagrams.

4309 Theorems Concerning the Drag Reduction of Wings of Fixed Plan Form. A. M. Rodriguez, P. A. Lagerstrom, and E. W. Graham. *Journal of the Aeronautical Sciences*, v. 21, Jan. 1954, p. 1-7.

Deals with problem of determining the geometry which leads to minimum drag of a wing of fixed plan form and given lift in supersonic flow. Linearized theory of an inviscid fluid is used. Diagrams. 7 ref.

4310 Temperature Distribution and Thermal Stresses in a Model of a Supersonic Wing. Frederick V. Pohle and Henry Oliver. *Journal of the Aeronautical Sciences*, v. 21, Jan. 1954, p. 8-16.

Effects of aerodynamic heating and of heat conduction are included. Diagrams, graphs, table. 5 ref

4311 Design and Performance of an Adjustable Two-Dimensional Nozzle With Boundary-Layer Correction. G. H. Backer. *Journal of the Aeronautical Sciences*, v. 21, Jan. 1954, p. 50-56.

Results verified that it would operate over a limited Mach number range without producing observable disturbances to uniform exit flow. Diagrams, photographs, table. 11 ref.

4312* Propeller Cavitation: Some Observations From 16-in. Propeller Tests in the New King's College Cavitation Tunnel. Lennard C. Burrill and Arnold Emerson. *North East Coast Institution of Engineers & Shipbuilders, Transactions*, v. 70, Dec. 1953, p. 121-150.

Reports tests on propellers of moderately high blade-area ratio and on series of ship propellers having different types of blade sections. Tables, diagrams, graphs, photographs.

4313 Transportation. *Westinghouse Engineer*, v. 14, Jan. 1954, p. 41-46.

Rain protection, alternator bearings, a.c. aircraft motors, a.c. aircraft generators solve jet aircraft problems. Photographs.

See also:
4760 (cooling of air borne equipment)
4808 (inspection of electroplated aircraft parts)
4898 (electropilot guides)
5062 (measuring thrust in flight)
5138 (aerodynamic reactions of airfoils)
5660 (plastics in aircraft)

AGRICULTURE

4314* The Effect of Grasses on Yield of Forage and Production of Roots by Alfalfa-Grass Mixtures With Special Reference to Soil Conservation. J. E. Woods, A. L. Hafenrichter, J. L. Schwendiman, and A. G. Law. *Agronomy Journal*, v. 45, Dec. 1953, p. 590-595.

Includes tables. 15 ref.

4315* Report of Committee on the Physics of Soil Moisture, 1952-1953. G. B. Bodman, chairman. *American Geophysical Union, Transactions*, v. 34, Dec. 1953, p. 938-944.

Listing of research in progress. Tables.

4316 Respiratory and Growth Responses Induced by Growth Regulators and Allied Compounds. Richard C. French and Harry Beevers. *American Journal of Botany*, v. 40, Nov. 1953, p. 660-666.

Results of series of experiments on segments of corn are reported. Table, diagram, graphs. 16 ref.

4317* An Investigation of Rodent and Insect Contamination of Corn and Corn Meal. Kenton L. Harris, J. L. Trawick, J. F. Nicholson, and William Weiss. *Association of Official Agricultural Chemists, Journal*, v. 36, Nov. 1953, p. 1037-1064.

Presents results of an investigation conducted to determine average degree of contamination and to evaluate effectiveness of grain cleaning equipment. Tables.

Agriculture

4318* The Electrometric Measurement of Soil *p*H. Lannes E. Davis and John M. Rible. *Association of Official Agricultural Chemists, Journal*, v. 36, Nov. 1953, p. 1146-1150.

Includes tables. 6 ref.

4319* Continuous Plant Cover the Key to Soil and Water Conservation. J. H. Stallings. *Better Crops With Plant Food*, v. 37, Dec. 1953, p. 13-20, 40-44.

Cover crops prevent splashing, puddling, runoff water and sealing of soil surface. Photographs, graphs, tables. 30 ref.

4320* General Rules Concerning Plant Nutrients. Arthur Wallace. *Better Crops With Plant Food*, v. 37, Dec. 1953, p. 21-24, 45-48.

An outline of five basic steps in nutrient control. Graphs, diagram. 29 ref.

4321* Disease Resistance in the Vegetable Crops. II. J. C. Walker. *Botanical Review*, v. 19, Dec. 1953, p. 606-643.

Reviews various crops and diseases to which they are susceptible. 266 ref.

4322* The Spread of Potato Virus Y in Seed Potatoes in Relation to the Date of Harvesting and the Prevalence of Aphids. R. H. Bagnall. *Canadian Journal of Agricultural Science*, v. 33, Nov.-Dec. 1953, p. 509-519.

Evaluates effect of aphid control with DDT. Describes experiments on early harvesting of potatoes. Tables. 18 ref.

4323* Some Observations on the Effects of Weather on the Utilization of Superphosphate and Manure Applied as a Top-Dressing to a Permanent Pasture. J. G. A. Fiskell, L. C. Raymond, H. A. Steppler, and W. A. DeLong. *Canadian Journal of Agricultural Science*, v. 33, Nov.-Dec. 1953, p. 531-541.

Data from yield of dry matter and phosphorus content were analyzed statistically for each of five dates of clipping. Tables, graphs. 22 ref.

4324* The Response of Various Forage Crops to Saline Soils. D. E. Forsberg. *Canadian Journal of Agricultural Science*, v. 33, Nov.-Dec. 1953, p. 542-549 + 2 plates.

Tests conducted in field and greenhouse on natural alkali soil from 1947 to 1951 show that slender and tall wheat grass were most alkali tolerant of all crops tested. Tables, photographs. 10 ref.

4325* The Uptake by Plants of Labelled Phosphate From Neutron-Irradiated Calcium Phosphates. III. Penetration Into Soil and Uptake by Pasture Herbage. J. G. A. Fiskell, W. A. DeLong, and W. F. Oliver. *Canadian Journal of Agricultural Science*, v. 33, Nov.-Dec. 1953, p. 559-565.

Shows that more than 90% P remained in the surface inch of the soil. Diagram, tables. 7 ref.

4326* Developments in the Chemical Control of Black Flies (Diptera: Simuliidae). B. Hocking. *Canadian Journal of Agricultural Science*, v. 33, Nov.-Dec. 1953, p. 572-578.

Various formulations of TDE, schradan, dieldrin, heptachlor, DDT, and three experimental compounds were tested. Tables. 5 ref.

4327* Removal of Organic Matter With Sodium Hypobromite for Particle-Size Analysis of Soils. S. J. Bourget and C. B. Tanner. *Canadian Journal of Agricultural Science*, v. 33, Nov.-Dec. 1953, p. 579-585.

Relative effectiveness of NaOBr digestion was compared to H_2O_2 digestion with and without acetic acid for removal of organic matter from non-calcareous and calcareous soils. Tables, graphs. 14 ref.

4328 Insect Population Balance and Chemical Control of Pests. E. Holmes. *Chemistry & Industry*, 1953, no. 49, Dec. 5, p. 1300-1302.

Discusses effect of insecticides on insect ecology and control of insects by biological and cultural methods. Describes research work being done to develop insecticides that are harmless to mammals.

4329* Possibility of Removing Weed Seeds From the Soil. (Russian.) A. V. Voevodin. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 325-328.

Mechanical and chemical methods were used. Herbicides 2,4-D and MCP are discussed. Tables. 18 ref.

4330* Growth of Ring Sprouts of the Lemon Plant Under Conditions of Restricted Mineral Supply. (Russian.) R. L. Vinokur. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 357-359.

Experiments demonstrated a close connection between activity of roots and sprouts along the plant. Photographs.

4331* The Ways Plants Use Potassium Absorbed by the Soil. (Russian.) E. I. Ratner. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 547-550.

Tests were made on a weak solution of KOH in amounts of 19 mg. per 100 hectares. Drawing, tables. 4 ref.

4332* Application of the Isotope Method for the Study of Sugar Cycles in Plants. (Russian.) A. L. Kursanov, M. V. Turkina, and I. M. Dubinina. *Doklady Akademii Nauk SSSR*, v. 93, no. 6, Dec. 21, 1953, p. 1115-1118.

Describes motion of sugars in vascular-fiber fascicle of sugar beets. Discusses use of marked atoms to observe velocity and direction of plant assimilations. Tables, graphs. 10 ref.

4333* Chemical Changes During Flue-Curing and Their Bearing on the Quality of Leaf of Cigarette Tobacco. A. S. Sastry. *Indian Academy of Sciences, Proceedings*, v. 38, sec. B, Sept. 1953, p. 125-141.

Discusses results of experimental studies. Tables, graphs. 39 ref.

4334* Mechanism of Fusarium Wilts of Plants. K. Lakshminarayanan. *Indian Academy of Sciences, Proceedings*, v. 38, sec. B, Oct. 1953, p. 161-164.

Reviews results of experimental studies. 14 ref.

4335* Biological Antagonists in the Future of Insect Control. C. P. Clausen. *Journal of Agricultural and Food Chemistry*, v. 2, Jan. 6, 1954, p. 12-18.

Evaluates biological control by utilizing disease producing organisms, greater state participation, and conserving the natural enemies. Photographs.

4336* Physical Factors Influencing Ammonia Absorption by Superphosphates. Rikio Kumagai, Herbert F. Rapp, and John O. Hardesty. *Journal of Agricultural and Food Chemistry*, v. 2, Jan. 6, 1954, p. 25-30.

Denseness and hardness of superphosphate particles, low reaction temperatures, and short reaction periods are factors contributing to poor ammonia absorption. Graphs, tables, photograph. 23 ref.

4337 Application of Precision Photoelectric Colorimeter to Determination of Oil Deposit on Laboratory-Sprayed Grapefruit. L. A. Riehl, F. A. Gunther, and R. L. Beier. *Journal of Economic Entolomology*, v. 46, Oct. 1953, p. 743-750.

Method of using a precision photoelectric colorimeter for determining amount of oil deposited by aqueous spray emulsions has been developed to study efficiency of various petroleum oil fractions against adult California red scale *(Aonidiella aurantii)* and eggs of the citrus red mite *(Metatetrancyhus citri)*. Tables, graphs. 14 ref.

4338 Translocation and Residual Action of Soil Insecticides. L. C. Terriere and D. W. Ingalsbe. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 751-753.

A series of plots were treated with DDT, BHC, dieldrin, aldrin, chlordane, toxaphene, EPN, and parathion. Tables. 5 ref.

4339 Some Effects of Storage at Different Temperatures on the Resistance of the American Roach to DDT. Sam C. Munson. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 754-760.

Includes tables. 16 ref.

4340 Control of the Green June Beetle as a Pest of Ladino Clover. W. L. Howe and W. V. Campbell. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 766-771.

Includes tables. 3 ref.

4341 Pyrethrum and Lindane in the Protection of Corn and Rough Rice From Stored Grain Insects. E. H. Floyd and C. E. Smith. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 771-774.
Includes tables.

4342 The Effects of *Nosema apis* on Package and Overwintered Honeybee Colonies Used for Alfalfa Pollination. W. W. Franklin. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 780-785.
Includes tables. 4 ref.

4343 Control of the Serpentine Leaf Miner on Peppers. George P. Wene. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 789-793.
Includes tables. 4 ref.

4344 The Relationship Between Populations of Alfalfa Insects and Soil Treatments With Boron. J. T. Medler and A. R. Albert. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 793-797.
Includes tables, photograph. 5 ref.

4345 The Differences Between Male and Female American Roaches in Total Lipid Content and in Susceptibility to DDT. Sam C. Munson and Marvin I. Gottlieb. *Journal of Entomology*, v. 46, Oct. 1953, p. 798-802.
Includes tables, graph. 21 ref.

4346 Developments Toward Biological Control of Cyclamen Mite on Strawberries in California. C. B. Huffaker and C. E. Kennett. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 802-812.
Includes graphs, tables, photograph. 11 ref.

4347 The Absorption, Distribution, and Metabolism of DDT in DDT-Resistant House Flies. A. S. Tahori and W. M. Hoskins. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 829-837.
Includes tables, graphs. 15 ref.

4348 Further Studies of the Action of Insecticides on Cotton Insects. Walter J. Mistric, Jr. and C. F. Rainwater. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 838-844.
Includes tables, graphs. 5 ref.

4349 Chemical Control of Cheese Mites. Robert J. Dicke, Keith D. Ihde, and Walter V. Price. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 844-849.
Includes tables.

4350 The Resistance of Insects to Insecticides. Some Differences Between Strains of House Flies. John J. Pratt, Jr. and Frank H. Babers. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 864-869.
Includes tables. 24 ref.

4351 Effect of Spray Programs in Cherry Orchards on Two Leafhopper Vectors of the Western X-Disease Virus in Washington. H. R. Wolfe and E. W. Anthon. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 873-876.
Includes tables.

4352 A Comparison of Evaporation Rates and Toxicity to House Flies of Lindane and Lindane-Chlorinated Polyphenyl Deposits. Ching-Hsi Tsao, W. N. Sullivan, and Irwin Hornstein. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 882-884.
Includes table, graph. 5 ref.

4353 Selection of the Large Milkweed Bug Through Seventeen Generations for Survival to Sublethal Concentrations of DDT and Toxaphene. James McD. Grayson. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 888-890.
Includes table, graph. 8 ref.

4354 The Stability of Lindane and Pyrenone Impregnated Dusts and Their Relative Toxicity to the Granary Weevil. Yung-Chang Chao and D. M. DeLong. *Journal of Economic Entomology*, v. 46, Oct. 1953, p. 908-910.
Includes graphs. 3 ref.

4355 Dry That Sludge. Knut Halle. *Land*, v. 9, Summer 1950, p. 245-246.
Feasability of dehydrating cannery wastes for fertilizers.

4356* Soil Density Determination by Means of Radioactive Isotopes. R. K. Bernhard and M. Chasek. *Nondestructive Testing*, v. 11, Nov.-Dec. 1953, p. 17-23.
Presents theoretical considerations and experimental data including apparatus and procedure. Photographs, graphs, diagram. 11 ref.

4357* The True Hemp *(Cannabis Sativa)*. A. E. Haarer. *Paper Making and Paper Selling*, v. 72, Autumn 1953, p. 6-8.
Presents uses, cultivation, yield, and harvest of this fiber. Photograph.

4358* Some Chemotherapeutic Agents for Wheat Stem Rust. Hugh Howison Hotson. *Phytopathology*, v. 43, Dec. 1953, p. 659-662.
Certain sulfa drugs will control wheat stem rust when applied as a post-infection spray at a rate as low as 5 lbs. per acre. Tables. 9 ref.

4359* The Cause of Epinastic Symptoms in Fusarium Wilt of Tomatoes. A. E. Dimond and Paul E. Waggoner. *Phytopathology*, v. 43, Dec. 1953, p. 663-669.
Ethyl alcohol and ethylene are both considered to be possible causes of epinasty. Tables. 17 ref.

4360* Heat of Respiration of Injured and Diseased Leaves. C. E. Yarwood. *Phytopathology*, v. 43, Dec. 1953, p. 675-681.
Injury or infection with pathogens increases respiration and evolution of heat by plant tissues, however in some cases this is due to host respiration. Graphs, diagram, tables. 21 ref.

4361* Participation of Humic Acids and Other Organic Substances in the Feeding of Higher Plants. (Russian.) L. A. Khristeva. *Pochvovedenie*, 1953, no. 10, Oct. p. 46-59.
Substances can be assimilated in small quantities in soluble form. They activate metabolism which increases productivity. Tables, graphs. 25 ref.

4362* Microorganisms and Soil Fertility. (Russian.) E. N. Mishustin. *Priroda*, v. 42, no. 10, Oct. 1953, p. 24-32.
Discusses beneficial and harmful microorganisms. Describes preparations which activate microbiological processes. Graph, diagram, photographs, micrographs.

4363* Phosphorus Requirements of Transplanted Tomatoes on Heavy Soils. Charles Y. Arnold. *Soil Science*, v. 76, Dec. 1953, p. 405-419.
Reports results of a series of field trials in which response of transplanted tomatoes to phosphorus fertilizer at several phosphorus fertility levels was studied. Tables, graph. 12 ref.

4364* Nickel Status of New Jersey Soils. L. I. Painter, S. J. Toth, and F. E. Bear. *Soil Science*, v. 76, Dec. 1953, p. 421-429.
Includes tables. 6 ref.

4365* More Durable Plaster of Paris Moisture Blocks. George John Bouyoucos. *Soil Science*, v. 76, Dec. 1953, p. 447-451.
A more durable plaster of paris soil moisture block has been perfected by treating blocks with a nylon plastic resin, which is tough and at the same time absorbs and gives up water readily. Photograph, graph. 6 ref.

4366* Adsorption of Water Vapor. I. Soils at 25 C. H. D. Orchiston. *Soil Science*, v. 76, Dec. 1953, p. 453-465.
Adsorption data for water vapor at 25 C on a wide range of New Zealand soils have been determined by vacuum desiccator method and found consistent with three basically different theories. Tables, graphs. 17 ref.

Agriculture

4367* Calcium-Potassium Interactions in Soils and Plants. II. Reciprocal Relationship Between Calcium and Potassium in Plants. E. T. York, Jr., Richard Bradfield, and Michael Peech. *Soil Science*, v. 76, Dec. 1953, p. 481-491.

Object of investigation was to study reciprocal relationship between Ca and K in plants, with special reference to influence of lime and gypsum upon absorption of K by alfalfa. Tables, graph. 28 ref.

4368* Determination of Exchangeable Calcium and Cation-Exchange Capacity by Equilibration With Ca^{45}. James M. Blume and Donald Smith. *Soil Science*, v. 77, Jan. 1954, p. 9-17.

Deals with comparisons of exchangeable calcium content of a variety of soils as measuered by equilibration method and by ammonium acetate extraction. Tables. 10 ref.

4369* Influence of Initial Soil Moisture Condition on Resistance of Macroaggregates to Slaking and to Water-Drop Impact. C. F. Cernuda, R. M. Smith, and Jose Vincente-Chandler. *Soil Science*, v. 77, Jan. 1954, p. 19-27.

Study was made to obtain information needed to understand extent to which aggregate stability, moisture status, and types of soil or soil material may be interrelated. Table, graphs. 12 ref.

4370* Phosphate Activity Measurement in Soils. Lloyd F. Seatz. *Soil Science*, v. 77, Jan. 1954, p. 43-51.

Investigates surface activity of P in representative samples of Tennessee soils by following progress of kinetic exchange reaction between soil P and its associated solution to which a minute amount of radioactive P had been added. Tables, graphs. 8 ref.

4371* Influence of Lime and Potassium on Yield and Cation Composition of Plants. E. T. York, Jr., Richard Bradfield, and Michael Peech. *Soil Science*, v. 77, Jan. 1954, p. 53-63.

Concerning effect of different levels of lime and potassium in Mardin silt loam on alfalfa, corn, Sudan grass, and sericea. Tables, graph. 23 ref.

4372* Control of the Potato Root Eelworm. John Grainger. *World Crops*, v. 6, Jan. 1954, p. 17-22.

Discusses disease characteristics, topographical spread, methods and materials of control, and economic considerations. Photographs, micrographs, tables, graphs. 17 ref.

Books and Miscellaneous Publications

4373 An Introduction to Statistical Science in Agriculture. D. J. Finney. 176 p. 1953. John Wiley & Sons, Inc., New York. (QA276 F49i)

Book is intended to supplement an elementary course of lectures for agricultural students who are without mathematical training; for many of these, it might represent their complete course of statistics, and for a few it might whet the appetite for fuller knowledge.

See also:
4495 (movement of soil moisture)
4522 (analytical studies on tobacco leaves)
4942 (world agricultural production)

BIOCHEMICAL AND BIOPHYSICAL RESEARCH

4374 Tetracycline, a New Antibiotic. L. E. Putnam, F. D. Hendricks, and H. Welch. *Antibiotics & Chemotherapy*, v. 3, Dec. 1953, p. 1183-1186.

Summary of tests of tetracycline compared with chlortetracycline. Graphs. 4 ref.

4375* Ascosin in the Treatment of Experimental Histoplasmosis in Mice. Chester W. Emmons and Robert T. Haberman. *Antibiotics & Chemotherapy*, v. 3, Dec. 1953, p. 1204-1210.

Effective in extending survival time of mice with experimental histoplasmosis but too toxic in present form for human histoplasmosis. Tables, graphs.

4376* Aureolic Acid, a New Antibiotic. I. Microbiologic Studies. Walton E. Grundy, Alma W. Goldstein, Charles J. Rickher, Marjorie E. Hanes, Halleck B. Warren, Jr., and John C. Sylvester. *Antibiotics & Chemotherapy*, v. 3, Dec. 1953, p. 1215-1217.

Includes tables. 4 ref.

4377* A Four Year Study of Bacterial Sensitivity to Five Antibiotics Using a Standardized Paper-Disk Method. Michael Kenny, Peggy M. Johnson, and Joseph S. Tatz. *Antibiotics & Chemotherapy*, v. 3, Dec. 1953, p. 1221-1234.

Penicillin, chlortetracycline, oxytetracycline, streptomycin, and chloramphenicol were antibiotics used. Tables. 20 ref.

4378* Amphomycin, a New Antibiotic. Bernard Heinemann, Murray A. Kaplan, Robert D. Muir, and Irving R. Hooper. *Antibiotics & Chemotherapy*, v. 3, Dec. 1953, p. 1239-1242.

Preliminary studies on production, isolation, antimicrobial spectrum, and properties of amphomycin. Tables. 4 ref.

4379* The Nature of the Dose-Response Curve in Penicillin Plate Assay. G. I. C. Ingram, A. W. H. Foxell, and P. Armitage. *Antibiotics & Chemotherapy*, v. 3, Dec. 1953, p. 1247-1257.

Apparatus was devised for simultaneous placing of 16 penicillin pad-reservoirs on seeded surface of a large assay plate. Responses were obtained at equal logarithmic intervals over the range 25,000-*ca.* 0.75 units per ml. against penicillinase and penicillinase-free strains of *Staph. aureus*. Tables, graphs. 17 ref.

4380* Hygromycin. I. Preliminary Studies on the Production and Biologic Activity of a New Antibiotic. R. C. Pittenger, R. N. Wolfe, M. M. Hoehn, Phoebe Nelms Marks, W. A. Daily, and J. M. McGuire. *Antibiotics & Chemotherapy*, v. 3, Dec. 1953, p. 1268-1278.

Includes tables, graphs. 3 ref.

4381* Lysogeny. André Lwoff. *Bacteriological Reviews*, v. 17, Dec. 1953, p. 269-336.

Lysogenic bacteria perpetuate hereditarily the power to produce bacteriophage. Discussion is made of development and processes. Graphs, tables, diagrams. 108 ref.

4382 Research on Industrial Enzymes. R. W. Watson. *Canadian Chemical Processing*, v. 37, Dec. 1953, p. 72, 74, 76.

Reviews 1952 progress which reveals further applications in industry and medicine. 45 ref.

4383* Substances in Herd Milks Inhibiting Acid Production. C. K. Johns. *Canadian Journal of Agricultural Science*, v. 33, Nov.-Dec. 1953, p. 586-592.

Of 344 samples of herd milks collected in the spring, 7.3% showed inhibitory effects against lactic starter organisms, as against 5.4% of 298 summer samples. Tables, graph. 9 ref.

4384 The Isolation of Bacteriophages for Mycobacteria With Reference to Phage Typing of the Genus. Stephen I. Hnatko. *Canadian Journal of Medical Sciences*, v. 31, Dec. 1953, p. 462-473 + 3 plates.

Includes tables, micrographs, photographs. 21 ref.

4385 Induced Variation and Strain Selection of *Penicillium Chrysogenum* in Relation to Titer of Natural Pencillins. Leone Farrell. *Canadian Journal of Medical Sciences*, v. 31, Dec. 1953, p. 512-522.

Includes tables, graphs. 13 ref.

4386* Oxidation of Ammonia and Synthesis of Albumin in a Pure Culture of *Nitrosomonas Europea*. (Russian.) V. O. Kalinenko. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 429-430.

Experiments with albumin production are described. Tables. 2 ref.

4387 Utilization of Ethanol by Acetic Acid Bacteria. M. R. Raghavendra Rao and J. L. Stokes. *Journal of Bacteriology*, v. 66, Dec. 1953, p. 634-638.

Includes tables. 9 ref.

4388* Competition Among Trypsin Inhibitors. N. Michael Green. *Journal of Biological Chemistry*, v. 205, Dec. 1953, p. 535-551.

Reports experimental studies undertaken to determine mechanism of 3 protein inhibitors on trypsin. Graphs, tables. 28 ref.

4389* Studies on the Fatty Acid Oxidizing System of Animal Tissues. II. β-Ketoacyl Derivatives of Coenzyme A. Helmut Beinert. *Journal of Biological Chemistry*, v. 205, Dec. 1953, p. 575-584.

Includes tables. 25 ref.

4390* The Role of Enzyme in Reversible Agglutination of Red Cells. Robert E. Hoyt and Helen Zwicker. *Journal of Immunology*, v. 71, Nov. 1953, p. 325-330.

Includes tables. 10 ref.

4391* Studies on Ribonuclease. I. Preparation & Properties of Ribonuclease From Castor Bean (*Ricinus communis* Linn.) B. Bheemeswar and M. Sreenivasaya. *Journal of Scientific & Industrial Research*, v. 12, sec. B, Nov. 1953, p. 529-531.

Enzyme preparation has been found to be free from proteolytic enzymes and desoxyribose-nuclease. Graphs, table. 12 ref.

4392* Action of Some Plant Extracts on Pathogenic Staphylococci. J. V. Bhat and Rajul Broker. *Journal of Scientific & Industrial Research*, v. 12, sec. B, Nov. 1953, p. 540-542; disc., p. 542.

Application of coagulase-positive test to pathogenic staphylococci has shown that extracts obtained from some plants used in indigenous medicine for treatment of skin infections possess property of markedly delaying coagulase producing capacity of the organisms. Tables. 7 ref.

4393* The Maintenance of Stock Cultures of Bacteria. S. T. Cowan. *Laboratory Practice*, v. 2, Dec. 1953, p. 641-643.

Includes diagram, table.

4394 Some Relationships Between Chemical Constitution and Biological Activity. W. A. Sexton. *Precision Metal Molding*, v. 12, Jan. 1954, p. 1356-1359.

Considers effects of exogenous chemicals and chemical basis for activity or functioning of substances which are normal metabolic constituents. 7 ref.

4395 The Synthesis of Pyrophosphate Coenzymes. G. W. Kenner. *Record of Chemical Progress*, v. 14, no. 3, 1953, p. 130-142.

30 ref.

4396 Failure of Mercaptoethylamine to Protect Against the Mutagenic Effects of Radiation. I. Experiments With *Drosophila*. II. Experiments With Mice. W. D. Kaplan and Mary F. Lyon. *Science*, v. 118, Dec. 25, 1953, p. 776-778.

Discusses results of experimental studies. Tables. 6 ref.

4397* Concerning Certain Changes of the Albumen Interchange Processes in the Animal Organism After Local and General X-Ray Radiation. (Russian.) B. M. Graevskaia. *Vestnik Rentgenologii i Radiologii*, 1953, no. 5, Sept.-Oct., p. 9-14.

Doses, equipment, and procedures are described. Increase of albumen content in blood is absolute and remains in a high level even after residual nitrogen and urea becomes normal. Tables, graph.

Books and Miscellaneous Publications

4398 Vitamins and Hormones. Robert S. Harris, G. F. Marrian, and Kenneth V. Thimann, editors. v. XI. 356 p. 1953. Academic Press Inc., New York. (QP801.V5 V83)

Includes "Function of Ascorbic Acid in Plants", L. W. Mapson; "The Biochemistry and Physiology of Vitamin D", R. Nicolaysen and N. Eeg-Larsen; "The Physiology and Biochemistry of Ascorbic Acid", A. P. Meiklejohn; "Endocrine Disturbances in Chronic Human Malnutrition", Salvador Zubirán and Francisco Gómez-Mont; "Relation of Pantothenic Acid to Adrenal Cortical Function", Elaine P. Ralli and Mary E. Dumm; "Recent Knowledge of the Biochemistry of the Thyroid Gland", J. Gross and Rosalind Pitt-Rivers; "Evaluation of Procedures for the Cytological Localization of Ketosteroids", Helen Wendler Deane and Arnold M. Seligman; and "Syntheses of Cortisone and Related Steroids", Carl Djerassi.

4399 Biology and Language. J. H. Woodger. 464 p. 1952. Cambridge Univ. Press, Cambridge, England. (QH307 W85b)

An introduction to methodology of biological sciences, including medicine.

See also:
4870 (signal transmission along nerves)
5117 (method of determining molecular weights)

CERAMICS AND CONCRETE

4400* Determination of the Na_2O Content in Synthetic Corundum, Various Slags, and Alumina. (Hungarian.) Miklós Ferenczy. *Aluminium (Budapest)*, v. 5, no. 9, Sept. 1953, p. 196-201.

Experimental details and results are discussed. Diagrams, tables. 21 ref.

4401 Studies on the Lime-Rich Crystalline Solid Phases in the System Lime-Silica-Water. G. L. Kalousek, J. S. Logiudice, and V. H. Dodson. *American Ceramic Society, Journal*, v. 37, Jan. 1954, p. 7-13.

Discusses starting materials and procedures, identification of solid phases, and results of studies. Tables, graphs. 10 ref.

4402 Metal-Ceramic Interactions: III. Surface Tension and Wettability of Metal-Ceramic Systems. Michael Humenik, Jr. and William D. Kingery. *American Ceramic Society, Journal*, v. 37, Jan. 1954, p. 18-23.

Discusses method using precise sessile-drop method. Diagrams, photograph, graphs, tables. 6 ref.

4403 Energy Relations in Binary Alkali Borates. L. Shartsis and W. Capps. *American Ceramic Society, Journal*, v. 37, Jan. 1954, p. 27-32.

Describes measurements made in 2*N*. HNO_3 with simple vacuum-bottle calorimeter. Tables, graphs. 7 ref.

4404* Factors Influencing the Strength of Concrete as Revealed by a Six-Year Record of Concrete Control. J. J. Waddell. *American Concrete Institute, Journal*, v. 25, Dec. 1953, p. 285-296; *ACI Proceedings*, v. 50, 1953, p. 285-296.

Includes tables, diagrams, charts.

4405* Floor Aggregates. E. W. Scripture, Jr., S. W. Benedict, and D. E. Bryant. *American Concrete Institute, Journal*, v. 25, Dec. 1953, p. 305-316; *ACI Proceedings*, v. 50, 1953, p. 305-316.

Results of an investigation to evaluate influence of different aggregates on wear resistance of concrete floors. Photographs, tables. 11 ref.

4406* Validity of Certain Assumptions in the Mechanics of Prestressed Concrete. Grover L. Rogers. *American Concrete Institute, Journal*, v. 25, Dec. 1953, p. 317-330; *ACI Proceedings*, v. 50, 1953, p. 317-330.

Validity of structural mechanics applicable to analysis of prestressed concrete structures is discussed. Diagrams, tables, graph.

4407* Determination of Non-Evaporable Water in Hardened Portland-Cement Paste. L. E. Copeland and J. C. Hayes. *ASTM Bulletin*, 1953, no. 194, p. 70-74.

Includes diagrams, graphs, table.

4408* Formation of Montmorillonite From Volcanic Glasses. (German.) Erich Neuwirth. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, no. 11, Nov. 1953, p. 236-239.

Photo- and electron-optical studies are reported. Effects on physical properties of bentonite are discussed. Micrographs. 3 ref.

4409* The Structure of Pottery Materials. (German.) H. Salmang. *Berichte der deutschen keramischen Gesellschaft*, v. 30, no. 11, Nov. 1953, p. 247-251.

Recommends use of 2% solution of $KMnO_4$ for studying porosity of ceramic goods. Photographs, graphs.

Ceramics and Concrete

4410* The Evaporation of Ceramic Glazings. (German.) W. Kerstan. *Berichte der deutschen keramischen Gesellschaft*, v. 30, no. 11, Nov. 1953, p. 254-256.

Shows that Pb content alone is not responsible for loss by vaporization. Includes data on vapor pressures of different pure oxides. Photographs, micrograph, tables, graph. 8 ref.

4411* Baryte-Bonded Silica Bricks. (German.) J. Klementz. *Berichte der deutschen keramischen Gesellschaft*, v. 30, no. 11, Nov. 1953, p. 257.

Refractory bricks are reported to be heat resistant up to 1400 C. 5 ref.

4412* Pulverized Fuel Ash in Brickmaking. B. Butterworth. *British Clayworker*, v. 62, Dec. 1953, p. 277-282.

Abstract of paper read at Autumn Meeting, British Ceramics Society, Building Materials Section, London, Nov. 1953. Includes tables, graphs.

4413 Manufacturing Defects. Their Causes and Cures. *Ceramic Industry*, v. 62, Jan. 1954, 17 p.

Presents alphabetical listing. Includes chinaware, procelain enamel, and glass containers.

4414 Ceramic Materials. A Complete Directory. *Ceramic Industry*, v. 62, Jan. 1954, 44 p.

Presents information on all known ceramic materials including formulas; physical characteristics; properties; and use in enamel, glass, and pottery.

4415 Alkali-Aggregate Interaction in Concrete. F. E. Jones. *Chemistry & Industry*, 1953, no. 52, Dec. 26, 1953, p. 1375-1382.

Presents discussion of experimental procedures and test results. Map, photographs, graphs, tables. 16 ref.

4416* Red Spherolite in Green Glass. (Russian.) M. A. Bezborodov and V. V. Lapin. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 389-391.

Spherolite described represents a three-phase substance. Table, micrograph.

4417* Making the Diagram of the State of $Al_2O_3 \cdot SiO_2$ System More Precise. (Russian.) P. P. Budnikov, S. G. Tresviatskii, and V. I. Kushakovskii. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 281-283.

Investigations were made utilizing high-temperature thermal analysis with a W-Mo thermocouple. Micrograph, graphs, table. 4 ref.

4418* New Type of Magnet Is Composed of Noncritical Ceramic Material. *Electrical Engineering*, v. 73, Jan. 1954, p. 102-103.

Material is lighter in weight than metal, has twice as much coercive force, and is a nonconductor.

4419 Metal-To-Ceramic Seals for Magnetron Waveguides. N. E. Pryslak. *Electronics*, v. 27, Jan. 1954, p. 282, 284-287.

A new technique in construction of sandwich-type seals is presented. Photographs.

4420 Chemistry of Inorganic Ferroelectric Materials. M. D. Rigterink. *Engineering Experiment Station News (Ohio State University)*, v. 25, Dec. 1953, p. 17-21.

Properties, crystal structure, and electronic applications of barium titanate are discussed. Graphs, micrographs. 6 ref.

4421* The Manufacture of Plate Glass. Harry Pilkington. *Glass*, v. 30, Dec. 1953, p. 555-564, 568.

Discusses development of industry; basic processes; changes in manufacturing methods; and raw materials, equipment, and techniques currently in use. Photographs, diagrams.

4422 Staff-Industry Collaborative Report. Graphite Electrodes. Rodney N. Hader, B. W. Gamson, and Bruce L. Bailey. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 2-11.

Discusses manufacture, methods of testing, and applications. Graphs, tables, photographs, diagrams. 7 ref.

4423 Recent Developments in Ceramics and Glass. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 141-188. Symposium before Div. of Ind. and Engr. Chem. at 123rd Meeting of ACS, Los Angeles, 1953. Includes "What's New in Glass", Alexander Silverman; "Electron Microscope Investigation of Glass", Albert F. Prebus and John W. Michener; "Statistical Theories as Applied to the Glassy State", O. L. Andreson and D. A. Stuart; "Coexisting Structures in Vitreous Silica", Clarence L. Babcock, Stephen W. Barber, and Kasimir Fajans; "Commercial Glass", A. K. Lyle; "Some Effects of High Energy Radiation on Glass", Norbert J. Kreidl; "Engineering for Increased Glass Production", R. W. Shute and B. W. King; "Recent Developments in Radiation-Sensitive Glasses", S. D. Stookey; "Application of Glass Fibers in Filtration Processes", Clayton A. Smucker and Wayland C. Marlow, Jr.; "Evolution of Industrial Glass Piping", Errol B. Shand; "Refractory Materials for Gas Combustion Equipment", Emil Blaha; and "Ceramics for Nuclear Power Applications", L. R. McCreight. Graphs, tables, photographs, diagrams. 118 ref.

4424 Technical Ceramics as Basic Materials. J. W. Deaderick. *Industrial Heating*, v. 20, Dec. 1953, p. 2484, 2486.

Briefly discusses advantages and characteristics of ceramic ware for applications requiring good resistance to heat, chemical stability, and dielectric or magnetic properties. Table.

4425* Progress Review No. 28: Refractories, 1950-1953. A. E. Dodd. *Institute of Fuel, Journal*, v. 26, Dec. 1953, p. 312-317.

Includes tables, graphs. 16 ref.

4426 Dynamics of the Graphite Lattice. Herbert B. Rosenstock. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 2064-2069.

Distribution of frequencies of normal vibrations in the graphite lattice has been obtained in closed form for low temperatures in the two-dimensional approximation for the values $(\alpha,\beta,0)$ and $(\alpha,\beta,\alpha/2)$ of the force constants (α,β,γ) for nearest, second-nearest, and third-nearest neighbors. Graphs, tables. 13 ref.

4427 Asbestos Textiles. What They Are, What They Can Do. Myril C. Shaw. *Materials & Methods*, v. 39, Jan. 1954, p. 89-93.

Discusses types and processing of asbestos and properties of chrysotile. Tables, photographs, graph.

4428 New Optical Glasses With Good Transparency in the Infrared. Rudolph Frerichs. *Optical Society of America, Journal*, v. 43, Dec. 1953, p. 1153-1157.

Arsenic trisulfide as a network former and different sulfides as network modifiers were used to produce glasses. Graphs, table. 22 ref.

4429* The Dielectric Relaxation of Glass and the Pseudo-Capacity of Metal-To-Glass Interfaces, Measured at Extremely Low Frequencies. (English.) J. Volger, J. M. Stevels and C. van Amerongen. *Philips Research Reports*, v. 8, Dec. 1953, p. 452-470.

Dispersion of dielectric constant of a glass in L. F. region has been investigated. Graphs, table, diagram. 21 ref.

4430 Magnetization in Nickel Ferrite-Aluminates and Nickel Ferrite-Gallates. Louis R. Maxwell and Stanley J. Pickart. *Physical Review*, v. 92, ser. 2, Dec. 1, 1953, p. 1120-1126.

Studies were made using trivalent Al and Ga. Preparation and properties are discussed. Graphs, photograph, diagrams. 18 ref.

4431* British Ceramic Society: Symposium on Casting Pit Refractories. *Refractories Journal*, v. 29, Dec. 1953, p. 513-517.

Consists of summaries of papers presented at the Autumn Meeting of the Refractory Materials Section, Nov. 1953, London. Includes "A Statistical Investigation Into Factors Affecting the Life of Ladle Linings", N. H. Bacon and J. E. Andrew; "Steel Ladle Trials on Fireclay Bricks", H. R. Lahr; "Laboratory Tests for the Assessment of Ladle Bricks", J. Mackenzie; "Performance of Continental Ladle and Runner Bricks", G. van Gijn; and "Note on the Relationship Between Bulk Density and Thermal Conductivity in Refractory Insulating Bricks", K. W. Cowling, A. Elliott, and W. T. Hale.

4431a* Fabrication of Frost, Acid, and Alkali-Resistant Wall Tiles. (German.) W. Wanie. *Sprechsaal*, v. 86, no. 21, Nov. 5, 1953, p. 523-526.

Characteristics of tile and glaze are discussed. Production methods are described. Diagram.

4432* Proposal for New Methods of Electrical Melting of Glass. (German.) Buhlman. *Sprechsaal*, v. 86, no. 22, Nov. 20, 1953, p. 547-548.

Describes construction and operation of apparatus. Diagrams.

4433* Accelerated Technical Process of Grinding Glass on 4 Sh S Machines Using Emery Dust. (Russian.) A. I. Korelova. *Steklo i Keramika*, v. 10, no. 9, Sept. 1953, p. 6-9.

Describes grinding procedure. Tables, profilogram.

4434* Application of Powders From Quartz Sand for the Grinding of Sheet Glass. (Russian.) Iu. A. Brodskii and Z. M. Zin'kova. *Steklo i Keramika*, v. 10, no. 9, Sept. 1953, p. 9-13.

Discusses substitution of quartz for corundum. Tables, graphs, diagram. 4 ref.

4435* Measuring the Electroconductivity of Glass in a Solid State. (Russian.) V. I. Sheliubskii. *Steklo i Keramika*, v. 10, no. 9, Sept. 1953, p. 13-15.

Describes equipment and experimental procedure. Diagrams, graph.

4436* New Glazes for Ceramic Articles. (Russian.) S. V. Filippova. *Steklo i Keramika*, v. 10, no. 9, Sept. 1953, p. 19-20.

Discusses compositions containing zircon. Table.

4437* Whiteness and Translucence of Porcelain, Their Relationship and Dependence on Firing Temperature. A. S. Berkman. *Steklo i Keramika*, v. 10, no. 9, Sept. 1953, p. 21-25.

Discusses firing of domestic porcelain. Tables, graphs.

4438* Obtaining Highly Transparent Glass in Continuous Tank Furnaces. (Russian.) K. T. Bondarev, V. A. Dubrovskii, V. V. Polliak, and I. E. Shapiro. *Steklo i Keramika*, v. 10, no. 12, Dec. 1953, p. 4-11.

Results of investigation shows necessity of eliminating potter's kilns and using tank furnaces in their place. Tables, graphs. 11 ref.

4439* Formation of Holes in the Surface of Vertically Drawn Glass. (Russian.) V. V. Polliak. *Steklo i Keramika*, v. 10, no. 12, Dec. 1953, p. 12-14.

Certain forming conditions were found to cause air holes. Table. 9 ref.

4440* Means of Determining the Strength Limit of Hollow Ceramic Construction Materials. (Russian.) I. A. Rokhlin. *Steklo i Keramika*, v. 10, no. 12, Dec. 1953, p. 20-22.

Describes tests to determine strength of different shaped tiles. Diagrams.

4441* Reasons for Appearance of Thread-Like Flaws in Glass Strip. (Russian.) K. Ia. Anan'ichev. *Steklo i Keramika*, v. 10, no. 12, Dec. 1953, p. 23-24.

States that basic cause lies in fusion of a glass-like substance which forms on the refractory masonry. Photograph.

4442* Some Characteristics of Glass Lined Tanks in Furnaces Which Have Ducts. (Russian.) A. A. Naida. *Steklo i Keramika*, v. 10, no. 12, Dec. 1953, p. 25-26.

Suggests a more rational setting of corner cross bars to prevent premature wear. Diagrams.

4443* Glass Fabric and Its Application in the Plastics Industry. (Hungarian.) Károly Schwaner. *Magyar Kémikusok Lapja*, v. 8, no. 12, Dec. 1953, p. 341-346.

Reviews production of glass thread and glass fabric. Reports on investigations done to determine relationship between type of weave and strength of layered plastics. Possibilities of application of plastics-glass fabric are outlined. Tables, photographs. 12 ref.

4444 Transmission Spectra of Thin Silicate Glass Films in the Infrared. V. A. Florinskaya and R. S. Pechenkina. *National Science Foundation Translation*, no. 30, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 37.)

Study of reflection and transmission spectra of silicate glasses in infra-red makes it possible to infer configuration of SiO_4 tetrahedron, which is the basic structural element of the glass and to determine presence or absence of order in the relative arrangement. Graphs. 10 ref.

4445 On the Behavior of Ferroelectrics Near the Curie Point. N. P. Bogoroditsky and T. N. Verbitskaya. *National Science Foundation Translation*, no. 44, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 447.)

Change of dielectric constant from original value reaches 30 to 35% and occurs mainly in first 30 to 40 days after preparation of samples. Graphs.

4446* Facts for the Cement Industry on Flow of Slurries. John R. Van Wazer. *Rock Products*, v. 56, Dec. 1953, p. 104-107.

Includes graphs, photographs, micrographs. 5 ref.

4447* Theory and Practice of Lime Manufacture. VII. Temperature Control of High Capacity Kilns. Victor J. Azbe. *Rock Products*, v. 56, Dec. 1953, p. 111-114, 146, 148.

Includes diagrams, graphs.

4448* Pozzolanic Cements From Blast Furnace Slag. R. C. Lied, J. H. Handwerk, and T. N. McVay. *Rock Products*, v. 56, Dec. 1953, p. 130, 136.

Includes tables.

4449* Complete Hydration of Lime Without the Use of Autoclaves. *Rock Products*, v. 56, Dec. 1953, p. 118-120.

Lee Lime Co., Lee, Mass., installs new type non-pressure hydrator for effective hydration of lime at a high rate of production. Hydrate exceeds ASTM requirements. Photographs.

4450* Decorative Tiles. Their Place in Ceramic Art. I. E. Stanley Wires. *Technology Review*, v. 56, Jan. 1954, p. 147-153, 168.

Traces course of development. Discusses various uses and importance in development of ceramic art. Map, photographs. (To be continued.)

4451* Measures to Increase the Stability of Rotary Furnace Linings. (Russian.) E. F. Skidan. *Tsement*, v. 19, no. 4, July-Aug. 1953, p. 4-6.

Describes successful method of lining furnaces at the cement factory "Kommunar". Productivity was shown to increase along with durability of the linings.

4452* Automatic Control of Calcination Process in the Rotary Furnace. (Russian.) E. N. Khodorov and N. N. Krasheninnikov. *Tsement*, v. 19, no. 4, July-Aug. 1953, p. 6-11.

Describes tests on rotary furnaces using recovery condensers. Diagram, graphs.

4453* Intensification of Calcination Process of the Clinker. (Russian.) N. A. Toropov and S. L. Vol'fson. *Tsement*, v. 19, no. 4, July-Aug. 1953, p. 12-16.

Study of action of fluorine and silicon fluoride salts on clinker formation of Portland cement demonstrated their effectiveness. Tables.

4454* Application of Blast Furnace Acid Slags Instead of Clay in the Wet Process of Portland Cement Manufacture. (Russian.) K. N. Zil'berman. *Tsement*, v. 19, no. 4, July-Aug. 1953, p. 16-19.

Tests show possibility of substitution. Tables.

4455* Method of Producing Asbestocement With the Use of Autoclave. (Russian.) T. M. Berkovich, I. L. Rabinov, and V. L. Gol'denveizer. *Tsement*, v. 19, no. 4, July-Aug. 1953, p. 19-23.

Describes operation of process which uses lot less than 50% finely milled quartz sand in the cement. Finished product was obtained 15 to 16 hr. after preparation. Tables.

Ceramics and Concrete

4456* Influence of Chloride Salts on the Formation of Calcium Sulfo-Aluminate. (Russian.) V. M. Moskvin and T. V. Rubetskaia. *Tsement*, v. 19, no. 6, Nov.-Dec. 1953, p. 3-8.
Results show that during action of NaCl on cement stone containing calcium hydro-aluminates, chlor-aluminate of calcium can be formed. This is destroyed under the action of calcium sulfate and a more stable compound of sulfo-aluminate of calcium is formed. Tables, graphs, micrograph. 5 ref.

4457* Study of the Microstructure of the Hardening Concrete in Reflected Light. (Russian.) A. E. Sheikin and L. A. Khapantseva. *Tsement*, v. 19, no. 6, Nov.-Dec. 1953, p. 9-11.
Describes a new method of preparing micro-specimens. Method permits establishment of various factors on structure of concrete. Micrographs, diagram.

4458* Problem of Controlling the Quality of Cement. (Russian.) O. M. Astreeva. *Tsement*, v. 19, no. 6, Nov.-Dec. 1953, p. 11-12.
Data on alite content can be obtained by using the polarized microscope. Table.

4459* Production of Sulfo-Aluminate Cement Calcinated at a Low Temperature. (Russian.) V. I. Kotov. *Tsement*, v. 19, no. 6, Nov.-Dec. 1953, p. 12-14.
Investigations were made to obtain sulfo-aluminate cement by treating clay with sulfuric acid and slaked lime. Tables.

4460* Petrographic Investigation of the Processes of Cement Corrosion. (Russian.) Iu. M. Butt and K. G. Krut. *Tsement*, v. 19, no. 6, Nov.-Dec. 1953, p. 16-21.
Describes effect of various aggressive media on clinker minerals with base and acid silicon slags. Tables, micrographs.

4461* Reaction of Water Glass and Sodium Fluosilicate in Acid-Resisting Cements. (Russian.) N. S. Dombrovskaia and M. R. Mitel'man. *Zhurnal Prikladnoi Khimii*, v. 26, no. 9, Sept. 1953, p. 899-906 + 1 plate.
Calculation of numerical value of coefficient *n* in sodium silicate reaction with sodium fluosilicate in the cement mass. Drawings, graphs, tables. 7 ref.

4462* Transformations of Aqueous Modifications of Calcium Sulfate. (Russian.) I. I. Korol'kov and A. V. Krupnova. *Zhurnal Prikladnoi Khimii*, v. 26, no. 9, Sept. 1953, p. 907-911.
Experimental results are discussed. Tables. 8 ref.

4463* Microhardness and Coefficient of Linear Expansion of Certain Glasses of the Porcelain Glass Phase Type. (Russian.) A. I. Avgustinik and E. P. Fedorova. *Zhurnal Prikladnoi Khimii*, v. 26, no. 9, Sept. 1953, p. 925-930.
Includes tables.

See also:
4486 (crystallization of ceramics)
4529 (determination of sodium in Portland cement)
4983 (fuels in ceramic industry)
5006 (combustion of fuel directly in brick clay during molding)
5220 (life of open hearth refractories)
5328 (steel wire for prestressed concrete)
5350 (ceramic materials for high temperature service)
5501 (heat resisting cermets)
5587 (research for cement)
5656 (properties of Mn-Zn ferrites)

CHEMICAL ENGINEERING

4464* A Half Century of Progress in Collagen Chemistry. John H. Highberger. *American Leather Chemists' Association, Journal*, v. 48, Dec. 1953, p. 704-719.
Reviews developments in concepts of structure of collagen fibril. Indicates their significance for leather chemist and tanner. Table, diagrams, micrographs. 48 ref.

4465* Review of Fifty Years Development in Leather Oils. Dominic Meo, Jr. and Lawrence B. Folsom. *American Leather Chemists' Association, Journal*, v. 48, Dec. 1953, p. 720-730.
Presents short summary of application of fats to leather including currying; emulsions; sulfation products—anionics; condensation products—non-ionics and cationics; and applied observations. 11 ref.

4466 Some Aspects of Molecular Distillaiton. *Chemical Age*, v. 69, Dec. 19, 1953, p. 1269-1272.
Discussion and comparison of three main types of distillation.

4467 Gyratory Vibration in Sieving. Justin Hurst. *Chemical Age*, v. 69, Dec. 19, 1953, p. 1273-1276, 1278.
Research in reduction of impactation of material during sieving process. Discussion of cascade machine.

4468 From Low Grade Domestic Ores: High Grade Manganese Dioxide. Elliott Schrier and Roger W. Hoffmann. *Chemical Engineering*, v. 61, Jan. 1954, p. 152-155, 372-375.
Describes large-scale production of battery-active MnO_2. Photographs, flowsheets.

4469 How and Why Solids Agglomerate. Carl Ludwig. *Chemical Engineering*, v. 61, Jan. 1954, p. 156-160.
Includes tables, diagrams, photographs.

4470 Chemical Engineering Fundamentals. Compression and Expansion. II. Thomas E. Corrigan and A. F. Johnson. *Chemical Engineering*, v. 61, Jan. 1954, p. 210, 212, 214, 216, 218, 220.
A brief review. Table, graphs. 4 ref.

4471 Refiners Embrace Petrochemicals. R. W. Thomas and P. M. Arnold. *Chemical and Engineering News*, v. 32, Jan. 4, 1954, p. 23-25.
Review of business and investments of oil refiners in 1953. Graphs.

4472 Chemical Engineering From Soaps to Salads. E. A. Lawrence. *Chemical Engineering Progress*, v. 49, Dec. 1953, p. 627-634.
Discusses raw material costs, conversion processes, distillation operations, fractional crystallization, solvent extraction, and fatty alcohol sulfates. Diagrams. 17 ref.

4473 Manufacture of Nitroglycerine by the Biazzi Continuous Process. H. J. Klassen and J. M. Humphrys. *Chemical Engineering Progress*, v. 49, Dec. 1953, p. 641-646; disc., p. 646.
Production of nitroglycerine by the Biazzi continuous process is described with special reference to design of equipment and operating experience at new Canadian plant. Diagrams, tables, graph, photograph. 6 ref.

4474 Free-Convection Mass Transfer at Vertical Plates. C. R. Wilke, C. W. Tobias, and Morris Eisenberg. *Chemical Engineering Progress*, v. 49, Dec. 1953, p. 663-674.
Mass-transfer coefficients for free convection have been evaluated from limiting rates of electrolysis and from rates of dissolution of organic solids. Graphs, diagrams, tables, photographs. 23 ref.

4475 Cooling Waters Require Careful Analysis and Treatment. Durando Miller. *Consulting Engineer*, v. 2, Dec. 1953, p. 32-36.
Discusses clarification; treatment to prevent scaling and corrosion in heat exchangers; removal of slime and organic matter; and cold lime, zeolite, and acid treatments. Photographs. 8 ref.

4476* Fractional Distillation. II. H. H. M Jones. *Chemical & Process Engineering*, v. 34, Dec. 1953, p. 381-383.
Discusses bubble plate and wetted wall columns; perforated plates; extractive, azeotropic, and batch distillation; industrial operation; and low temperature separation. 60 ref.

4477 Heat Insulation and Plant Efficiency. A. G. Shore. *Chemistry in Canada*, v. 5, Dec. 1953, p. 248-251.
Discusses how heat insulation represents an important factor in plant efficiency. Outlines how its proper use can represent large savings in a modern plant. Graphs, photograph. 3 ref.

4478 Integration of an Oil Refinery. A. J. Carter. *Chemistry & Industry*, 1953, no. 49, Dec. 5, p. 1294-1299.

Discusses refining processes. Graph, diagrams.

4479* Recent Results on Hydrogenation of Mineral Oils. (German.) W. Oettinger. *Erdöl und Kohle*, v. 6, no. 11, Nov. 1953, p. 693-696.

Discusses use of Al silicates with oxides and sulfides of Mo, W, and other heavy metals as catalysts for cracking of heavy oils into high-octane gasoline and diesel oil. Describes removal of S, N, and O with selective catalysts. Diagrams, tables, graph.

4480* Processing Mineral Oil by a Combination of Hydrogenation and Cracking. (German.) K. Wissel. *Erdöl und Kohle*, v. 6, no. 11, Nov. 1953, p. 696-700.

Includes evaluation of results. Diagrams, tables. 12 ref.

4481* An Aspect on the Magnetic Properties of Coals. (Japanese.) Hidemasa Honda. *Fuel Society of Japan, Journal*, v. 32, no. 317, Sept. 1953, p. 486-493.

Four coals were separated into portions of different density by float-and-sink method. Magnetic susceptibility, density, ultimate analysis, proximate analysis, and calorific value of each portion were determined and compared. Tables, graphs. 5 ref.

4482* "On Stream"—Modernization of an Old Refinery (Esso's Everett, Massachusetts). *Heating Engineering*, v. 28, Oct.-Dec. 1953, p. 108-111.

Integration of design and construction of Model IV Fluid Catalytic Cracking Units with converted units from a refinery is discussed. Photographs.

4483 Batchwise Fractional Liquid Extraction. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 16-45.

Includes "Calculation of Liquid-Liquid Extraction Processes", Edward G. Scheibel; "Double Withdrawal and the Gambler's Ruin", Edgar L. Compere and Ada L. Ryland; "Holdup and Approach to Steady State", Donald F. Peppard and Marvila A. Peppard; "Countercurrent Contactors", Peter L. Auer and Clifford S. Gardner; and "Calculation of Deviation From Steady State", Edward G. Scheibel. Graphs, tables, diagrams. 53 ref.

4484 Torpidity of Stirred Phlegmatic Liquids. K. C. D. Hickman. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 45-52.

Reports results of studies which show that when a partly submerged paddle is moved in a liquid evaporating in micron-millimeter pressure range, different quantities and compositions of vapor should be emitted on fore-and-aft sides of paddle. Tables, diagrams, graphs. 5 ref.

4485 Adsorption. B. L. Harris. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 64-72.

Reviews industrial applications of gas phase and liquid adsorption emphasizing adsorptive rectification. 351 ref.

4486 Crystallization. C. S. Grove, Jr., Herbert M. Schoen, and Joseph A. Palermo. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 75-78.

Discusses increased interest in nucleation and theory of crystallization. Reports attention to growth of large single crystals with emphasis on quartz, Ge, and crystalline ceramics. Photograph. 82 ref.

4487 High Temperature Distillation. T. J. Walsh. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 79-82.

Reviews principles and applications as industrial and laboratory tool. Photograph. 106 ref.

4488 Drying. F. A. Gluckert. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 82-86.

Discusses improvements and modifications of equipment expecially in aerodynamic, combustion, and heat transfer fields. Report need for still further work. 149 ref.

4489 Evaporation. W. L. Badger and R. A. Lindsay. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 87-90.

Reports little advance in theory in past year. Scale continues to be problem of major interest. 64 ref.

4490 Liquid Extraction. Robert E. Treybal. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 91-99.

Reports considerable volume of new equilibrium data, experimental work in mass transfer rates, and interest in special equipment. Tables, diagrams, photographs. 229 ref.

4491 Filtration. S. A. Miller. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 100-105.

Reports that validity of designing and centrifugal filters on basis of permeability compression cell data has been established. Discusses work on porosity and structure of filter cakes, filtration of wood pulp, and dewatering and conditioning of sewage sludge. Table. 154 ref.

4492 Ion Exchange. Robert Kunin and F. McGarvey. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 118-125.

Reports considerable advance in technology in past year. 549 ref.

4493 Leaching. Robert A. Ebel. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 126-129.

Discusses pilot plant developments of both processes and new equipment. Reports work has been done predominantly in sugar, metallurgical, and oilseed industries. 88 ref.

4494* The Present Status of the Art of Cracking Petroleum Fractions. W. C. Dickerman, Jr. *Institute of Petroleum, Journal*, v. 39, Nov. 1953, p. 765-788; disc., p. 788-794.

Reviews various thermal and catalytic processes with typical processing schemes. Diagrams, graphs, tables. 43 ref.

4495 Theory of the Formation of Bubbles. Shunsuke Takagi. *Journal of Applied Physics*, v. 24, Dec. 1953, p. 1453-1462.

Presents perfect theory of formation of bubbles where bubbles of vapor are nucleated spontaneously in pure liquid. Diagrams, tables, graphs. 16 ref.

4496 Carbon in the Engineering and Metallurgical Industries. V. Chemical, Mechanical and Electrical Uses. V. S. Kingswood. *Metallurgia*, v. 48, no. 290, Dec. 1953, p. 301-305.

Includes table, diagrams, photograph. 5 ref.

4497 Use of Wire-Mesh Sections in Asphalt Entrainment Control in Vacuum Pipe Stills. III. H. J. Oberling. *Oil and Gas Journal*, v. 52, Dec. 28, 1953, p. 70-73.

Describes installations, types of metals used, and effects on refining operations. Diagrams, tables.

4498 Petrochem Report: Small Refinery, But Big Products List. John C. Reidel. *Oil and Gas Journal*, v. 52, Jan. 4, 1954, p. 72-75, 91.

Describes equipment, plant layout, and operating procedures. Photographs, diagrams. 7 ref.

4499 What's New in Cooling-Tower-Wood Maintenance. C. L. Blohm, M. Tarplee, and E. C. Smith. *Oil and Gas Journal*, v. 52, Jan. 11, 1954, p. 78-81, 110, 113, 117-118.

Discusses types of deterioration; factors influencing intensity; and control and prevention. Photographs.

4500 Acid Sludges Regenerated to Make 98 Per Cent H_2SO_4. F. Lawrence Resen. *Oil and Gas Journal*, v. 52, Jan. 18, 1954, p. 101-104.

Process does away with burning of sludges in boilers and eliminates necessity for operating hydrolyzing and concentration units. Photographs, diagrams.

4501 Reaction Kettles for Synthetic Resin Production. John Philip. *Paint Manufacture*, v. 23, Dec. 1953, p. 410-416.

Describes types, construction, and operation. Diagrams, graphs, photographs. 5 ref.

4502 Synthesis of Mesitylene From Acetone. Kenneth A. Kobe and Leo J. Hirth. *Petroleum Processing*, v. 9, Jan. 1954, p. 92-93, 96.

Discusses continuous catalytic process giving excellent yields. Diagram, table. 9 ref.

Chemical Engineering

4503 Desulfurization Symposium. Desulfurization Today. V. A. Kalichevsky and E. H. Peters. *Petroleum Refiner,* v. 32, Dec. 1953, p. 81-92.

Includes papers on "Autofining"; "Unifining"; "Cycloversion"; "Tannin Solutizer"; "Gray Desulfurization"; "Unisol Mercaptan Extraction"; "Mercapsol Treating"; "Electrolytic Caustic Regeneration"; and "Shell Hydrodesulfurization". Graphs, diagrams, tables.

4504 Tonnage Oxygen. I. Rectification and Refrigeration. Peter W. Sherwood. *Petroleum Refiner,* v. 32, Dec. 1953, p. 93-96.

Includes tables, diagram. 9 ref.

4505 Concentrated Gas-Solvent Systems. Walter B. Howard. *Petroleum Refiner,* v. 32, Dec. 1953, p. 97-99.

By development of mathematical relations for the equilibrium constant, applicability of Henry's Law is extended to solutions of high concentrations. Tables, diagram. 7 ref.

4506 Petrochemical Reactions. VII. The Reactions of the Olefins. Lewis F. Hatch. *Petroleum Refiner,* v. 32, Dec. 1953, p. 100-104.

Includes diagrams, photographs, table.

4507 Vapor-Liquid Equilibrium Ratios. II. Ternary and Multicomponent Systems. J. M. Lenoir and G. A. White. *Petroleum Refiner,* v. 32, Dec. 1953, p. 115-119.

Convergence pressures of multicomponent mixtures may be easily calculated by this method. Tables, graphs.

4508 New Design Features of Houdriflow. R. M. Shirk and D. B. Ardern. *Petroleum Refiner,* v. 32, Dec. 1953, p. 121-125.

Vast improvements have been made in design of modern Houdriflow units. Details on reactor vapor disengager; kiln air distributor; kiln cooling coils; and kiln withdrawal sections are included. Diagrams.

4509 New Fluid Coking Process Unveiled. A. Voorhies, Jr. and H. Z. Martin. *Petroleum Refiner,* v. 32, Dec. 1953, p. 127-130.

Most recent process contribution to solution of the fuel oil problem is Esso's new fluid coking process. Details important data on operating conditions, yields, and design factors. Diagrams, tables, photograph. 4 ref.

4510 The Lummus Continuous Contact Coking Process. Valentine Mekler, A. H. Schutte, and T. T. Whipple. *Petroleum Refiner,* v. 32, Dec. 1953, p. 131-134.

Designed to convert low value residua into more useful middle distillates, the first installation of new process claims advantages of continuous rather than batch operation; higher octane gasoline; and high yield of olefins. Tables, graphs, diagram, photograph. 3 ref.

4511 Tonnage Oxygen. II. Heat Exchange Methods and Impurities Removal. Peter W. Sherwood. *Petroleum Refiner,* v. 33, Jan. 1954, p. 129-132.

Includes diagrams, tables. 8 ref.

4512 Understanding the Chemistry of Petrochemical Reactions. VIII. The Production of Olefins. Lewis F. Hatch. *Petroleum Refiner,* v. 33, Jan. 1954, p. 155-157.

Includes diagrams, table. (To be continued.)

4513 Try This Practical Form of Heat and Material Balance. Harold Bottomley. *Petroleum Refiner,* v. 33, Jan. 1954, p. 159-161.

Presentation of a condensed form of heat and material balance which supplies all necessary data to size equipment for the process unit. Diagrams, tables.

4514* What Part Does Chemical Coagulation Play In Today's Water-Treatment Practices? Sheppard T. Powell. *Power,* v. 98, Jan. 1954, p. 80-82, 216, 218, 220.

Gives a method of removing impurities that are in form of suspensions in liquids. Table, photograph, graphs.

4515 Applied Thermodynmics in Chemical Engineering. H. M. Hulburt and T. P. Forbath. *Research,* v. 6, Dec. 1953, p. 473-480.

Outlines motivation for use of thermodynamics and a few of its applications to specific problems typical of those which arise in chemical engineering. Graphs, diagrams, table.

4516* Review of the Catalytic Cracking Process. (Italian.) *Rivista dei Combustibili,* v. 7, no. 10, Oct. 1953, p. 656-665.

Discusses kinetics of reaction, thermodynamics, and fluid mechanics. Graph. (To be continued.)

4517* Research on the Operating Behavior of the Dry Generator ATE 50 N. (French and German.) C. Keel and P. Hartmann. *Zeitschrift für Schweisstechnik,* v. 43, no. 12, Dec. 1953, p. 238-247.

Discusses effects of temperature, rate of water injection, and different brands of carbide to increase rate of actylene generation. Tables.

Books and Miscellaneous Publications

4518* Distillation Literature. Index and Abstracts. 1946-52. Arthur Rose and Elizabeth Rose. unpaged. 1953. Applied Science Laboratories, Inc., State College, Penna. (Z5524.D58 R72d2)

Includes abstracts of and references to articles in scientific and technical journals, and to patents, books, news items, and advertising announcements of importance.

4519 Hydrocarbons From Petroleum. Frederick D. Rossini, Beveridge J. Mair, and Anton J. Streiff. 556 p. 1953. Rheinhold Publishing Corporation. New York. (TP248.H9 R73h)

Summarization of knowledge and data obtained by the API Research Project 6.

4520 General Papers Presented Before the Division of Petroleum Chemistry of the American Chemical Society. 239 p. Mar. 1953. American Chemical Society, Div. of Petroleum Chemistry. (TP690 AM35g)

Includes "Corrosive Action of Dissolved Gases on Steel in Water", J. W. Watkins and J. Wright; "Determination of Hydroperoxides in Petroleum Products", D. C. Walker and H. S. Conway; "Nitrogen Compounds in Distillate Fuels", L. F. Ward, Jr., R. T. Moore, and J. S. Ball; "Determination of Total Nitrogen in Petroleum Distillates by Catalytic Hydrogenation", C. Wankat and J. G. Gatsis; "A Procedure for Estimating the ASTM End Points of Blends of Light Petroleum Products", M. E. Stanley and G. D. Pingrey; "Hydrocarbons in the 126 to 132 C Fraction of Petroleum", M. B. Epstein, C. B. Willingham, B. J. Mair, and F. D. Rossini; "An Investigation of Combustion Chamber Deposit Formation and Scavenging Using Tetraethyl Radiolead", H. P. Landerl and B. M. Sturgis; "Physical Chemistry of the Fischer-Tropsch Synthesis on Iron Catalysts", R. B. Anderson; "Formation of Hydronaphthalenes From Cyclopentyl Rings in Acid-Catalyzed Reactions", W. K. Conn and A. Schneider; "The Relative Reactivities of Naphthalenes and Isoparaffins in Low-Temperature Reactions With Carbonium Ions", A. Schneider; "Sulfuric Acid Isomerization of Methylalkanes, Dimethylalkanes, and Dimethylcyclohexanes", A. K. Roebuck and B. L. Evering; "Disproportionation of Alkylbenzenes. I. Equilibrium and Rate Studies", A. P. Lien and D. A. McCaulay; "Disproportionation of Alkylbenzenes. II. Mechanism of Alkyl-Group Transfer", D. A. McCaulay and A. P. Lien; "Reactions of Some C_5-C_8 Paraffins With Silica-Alumina Cracking Catalyst. I. Hydrogen Exchange", G. A. Mills, A. G. Oblad, and S. G. Hindin; "Reactions of Some C_5-C_8 Paraffins With Silica-Alumina Cracking Catalyst. II. Isomerization", A. G. Oblad, S. G. Hindin, and G. A. Mills; "The Effect of Impurities on the Carbon-Oxygen Exchange in Chemisorbed Carbon Monoxide", A. N. Webb and R. P. Eischens; "Data on Hydrocarbons and Related Compounds Available on IBM Punch Cards", J. Sherman; "Combination Batch and Continuous Fractionation Column", S. T. Kiguchi; "A Laboratory Moving Bed Contact Coking Apparatus", D. C. Jones, T. E. Kelly, and M. B. Neuworth; "Bench-Scale, Continuous, Downflow Fluid-Bed Catalytic Cracking Unit", J. A. Marshall and J. W. Askins; "Separation of Sulfur Compounds. I. Extraction nad Recovery of Thiols", R. L. Hopkins and H. M. Smith;

"Thermal Stability of High-Sulfur Crude Oils", H. J. Coleman, C. J. Thompson, H. T. Rall, and H. M. Smith; "Catalytic Polyforming of a Petroleum Gas Oil", L. Berg, L. G. Mayfield, H. A. Saner, W. F. Polich, B. A. Ennenga, R. B. Hamilton, R. D. Lewallen, and R. L. Crecelius; "Reforming With Carbon Catalysts", R. A. Sanford, and B. S. Friedman; and "Effect of Hydrocarbon Structure on Physical Properties", R. W. Schiessler.

See also:
4446 (flow of slurries)
4745 (treatment of boiler feed water)
5005 (petroleum plant design, catalytic cracking)
5007 (lignite as source of chemicals)
5008 (chemicals from coal)
5230 (flotation of ores and coal)
5241 (flotation of minerals)
5663 (plastics from petroleum)

CHEMISTRY—ANALYTICAL AND INORGANIC

4521* A Micromolecular Still. R. F. Paschke, J. R. Kerns, and D. H. Wheeler. *American Oil Chemists' Society, Journal*, v. 31, Jan. 1954, p. 5-7.

Presents description of apparatus, calibration of instrument, operational procedures, and applications. Diagrams, table. 8 ref.

4522 Analytical Studies on Harvested Tobacco Leaves. W. G. Frankenburg, A. M. Gottscho, Suzanne Kissinger, Doris Bender, and Margaret Ehrlich. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1784-1798.

Scheme of analysis was devised to permit not only determination of known constituents, but also classification of unknown N compounds in tobacco leaves. Diagram, graphs, tables. 79 ref.

4523 Differential Method for Precision Colorimetric Analysis. Anders Ringbom and Kurt Österholm. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1798-1803.

Method makes it possible to utilize sensitivity of photoelectric instruments more effectively than is usual. Diagram, graphs, tables. 11 ref.

4524 Ultraviolet Spectrophotometric Determination of Tantalum With Pyrogallol. Joseph I. Dinnin. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1803-1807.

Method consists in measuring absorbancy of Ta-pyrogallol complex at 325 m μ in 4 N hydrochloric acid and a fixed concentration (0.0175M) of ammonium oxalate. Graphs, table. 29 ref.

4525 Spectrophotometric Determination of Arsenic and Tungsten as Mixed Heteropoly Acids. Delora K. Gullstrom and M. G. Mellon. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1809-1813.

Study concerns formation of two heteropoly complexes, molybdovanadoarsenic acid and tungstovanadophosphoric acid, and their colorimetric applications to determination of As and W. Tables. 11 ref.

4526 Analysis of Sodium Pyro- and Tripolyphosphate Mixtures. Alton J. Mabis and Oscar T. Quimby. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1814-1818.

Quantitative method has been developed based on X-ray diffraction, using MgO as an internal standard. Graphs, tables. 5 ref.

4527 Determination of Naphthalene in Wash Oil and Coke Oven Gas. N. J. Klein and G. W. Struthers. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1818-1821.

Method utilizes intensity of specific naphthalene absorption band at 12.77 microns as a quantitative measure of naphthalene content of wash oil. Compensation is made for slight absorbence exhibited by wash oil itself at this wave length. 2,2,4-Trimethylpentane (iso-octane) is used as solvent for wash oil samples. In this medium, back-ground absorbence of oil is fairly linear with its concentration. Tables. 5 ref.

4528 Flame Spectrophotometric Determination of Sodium and Potassium. Howard M. Bauserman and Rob Roy Cerney, Jr. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1821-1824.

Controlled analytical method is developed for solutions having characteristics differing from water. Graphs, tables. 13 ref.

4529 Improvements in Flame Photometric Determination of Sodium in Portland Cement. J. J. Diamond and Leonard Bean. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1825-1830.

Increased accuracy was obtained by using an auxiliary multilayer interference filter to narrow effective band width of the instrument or by removing silica from cement prior to determination of Na. Graphs, tables. 16 ref.

4530 Rapid Photometric Determination of Cobalt in the Presence of Iron. J. N. Pascual, W. H. Shipman, and Wilson Simon. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1830-1832.

Data are presented to substantiate and illustrate techniques employed. Tables, graphs. 9 ref.

4531 Amperometric Titration and Voltammetric Determination of Iodide. I. M. Kolthoff and Joseph Jordan. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1833-1837.

Methods were tested over a wide range of iodide concentrations from $10^{-3}M$ down to extreme dilutions where sensitivity of current measuring instruments became limiting factor. Graphs, table. 12 ref.

4532 Titration of Weak Bases in Acetic Anhydride Solvent Mixtures. James S. Fritz and Myron O. Fulda. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1837-1839.

Purpose of investigation was to study effect of titrating bases in organic solvents from which last traces of water have been removed by addition of excess acetic anhydride. Graphs, tables. 7 ref.

4533 Direct Extraction-Pycnometer Method for Oil Content of Refinery Effluents. W. S. Levine, G. S. Mapes, and M. J. Roddy. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1840-1844.

Describes a rapid and accurate method, which is especially applicable to waste waters having appreciable quantities of volatile material. Photograph, diagram, tables. 12 ref.

4534 Uncombined Calcium Oxide or Hydroxide in Lime and Silicate Products. Gunnar O. Assarsson and Jean M. Boström. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1844-1848.

Methods for volumetric determination of uncombined calcium oxide and hydroxide extracted from lime and silicate products by glycerol, ethylene glycol, and acetoacetic ester have been studied. Tables, graphs. 14 ref.

4535 Quantitative Determination of Isomers of *O,O*-Diethyl Ethylmercaptoethyl Thiophosphate. Kenneth Gardner and D. F. Heath. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1849-1853.

Chromatographic method of analysis is described. Tables, diagrams. 24 ref.

4536 Determination of Zinc With Special Reference to Separation From Cobalt and Copper. A. E. Martin. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1853-1858.

Extraction of Zn from citrate solutions at pH 5 to 10 with di-2-naphthylthiocarbazone and sodium diethyleithiocarbamate is described. Graphs, tables. 23 ref.

4537 Reactions of Aromatic Nitro Compounds With Active Methyl, Methylene, Methine Groups in Presence of Base. Julius J. Carr. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1859-1863.

Method can be extended to other nucleophilic substances, particularly ketones. Graphs, tables. 12 ref.

4538 Colorimetric Determination of Vanadium(V) and Its Separation From Copper. Hobart H. Willard, Ernest L. Martin, and Robert Feltham. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1863-1865.

New colorimetric method was developed for V in the presence of Cu and a convenient separation from Cu. Graph, tables. 4 ref.

Chemistry—Analytical and Inorganic

4539 Automatic Measurement of Light Absorption and Fluorescence on Paper Chromatograms. James A. Brown and Max M. Marsh. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1865-1869.

Attachment described is designed for use with a commercially available monochromator employing a stabilized light source such as the Beckman Model DU spectrophotometer. Photographs, tables, graphs. 6 ref.

4540 Determination of Elemental Fluorine. Irving Sheft, Herbert H. Hyman, and Joseph J. Katz. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1877-1879.

Method involves titration of a known amount of bromine dissolved in bromine trifluoride with fluorine gas to be analyzed. Diagram, table. 9 ref.

4541 Determination of Maleic Hydrazide Residues in Plant and Animal Tissue. Paul R. Wood. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1879-1883.

Hydrazide is reduced and hydrolyzed in water, alkali, and Zn, to split off hydrazine, which is then distilled and determined colorimetrically using *p*-dimethylamino-benzaldehyde. Residue determinations of below 1 p.p.m. are possible. Graphs, diagrams, table. 8 ref.

4542 Differential Determination of Vitamin B_{12} Group. Saburo Fukui. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1884-1886.

New differential assay of individual components of vitamin B_{12} group with *Sacch. carlsbergensis* 4228 has been studied. Tables, diagram. 8 ref.

4543 Quercetin as Colorimetric Reagent for Determination of Zirconium. Frank S. Grimaldi and Charles E. White. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1886-1890.

Procedure developed involves separation of Zr from interfering elements by precipitation with p-dimethyl-aminoazophenylarsonic acid prior to its estimation with quercetin. Graphs, tables. 14 ref.

4544 Vacuum Fusion Analysis. William S. Horton and Joseph Brady. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1891-1898.

Describes apparatus designed and constructed for research in vacuum fusion analysis. Diagrams, tables. 30 ref.

4545 Comparison of Spectrochemical and Semimicromethods in Analysis of Petroleum Ashes. G. V. Dyroff, John Hansen, and C. R. Hodgkins. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1898-1905.

Samples of ashes from various petroleum fractions have been analyzed by spectrochemical and semimicro-procedures. Data obtained have been subjected to a statistical evaluation. Diagrams, tables, graph. 28 ref.

4546 Infrared Identification of Materials in the Fractional Milligram Range. Don H. Anderson and N. B. Woodall. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1906-1909.

The above is accomplished by means of a beam condensing system and pressed K Br pellets containing the sample. Graphs, diagrams, photograph. 4 ref.

4547 Simultaneous Titration of Iron and Copper With Ethylenediaminetetraacetic Acid. A. L. Underwood. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1910-1912.

Includes graph, table. 8 ref.

4548 Rapid Interferometric Analysis of Germane-Hydrogen Mixtures. Mino Green and Paul H. Robinson. *Analytical Chemistry*, v. 25, 1953, p. 1913-1914.

Rayleigh-Zeiss interferometer, fitted with a 500-mm. double-chamber gas cell was used for assaying germane-hydrogen mixtures. Method depends upon measuring difference in refractive index between hydrogen and germane-hydrogen mixture, and so involves an initial calibration with germane-hydrogen mixtures of known composition. Diagram. 3 ref.

4549 Mass Spectrometric Analyses of Some Six- and Seven-Carbon Alcohols. V. A. Yarborough. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1914-1916.

Includes diagrams, tables. 14 ref.

4550 Reference Electrode for Potentiometric Titrations in Glacial Acetic Acid. R. A. Glenn. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1916-1917.

Paper reports on use of Ag-AgCl electrode in conjunction with the glass electrode and how instability of the electrode pair in the region of the end point may be obviated. Graphs, diagram. 10 ref.

4551 Spectrophotometric Determination of Copper in Ores With 2,2'-Bipyridine. J. P. Mehlig and P. L. Kochmstedt. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1920-1921.

Method was applied to determination of Cu in six ores, four oxides, and two mattes. Duplicate determination were made for each sample. At least two aliquots were analyzed for each duplicate. Tables. 11 ref.

4552 Europium Determination in Rare Earth Mixtures. David C. Foster and Howard E. Kremers. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1921-1922.

Method consists of passing a rare earth chloride solution containing Eu through a Jones reductor into an excess of ferric chloride. An amount of ferric chloride equivalent to the amount of Europous chloride formed by reduction is reduced to ferrous chloride. The latter is titrated with standard potassium dichromate solution. Table. 4 ref.

4553 Polarographic Analysis of Lead Driers. D. A. Skoog and Robert L. Focht. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1922-1924.

A number of commercial driers were analyzed. Tables. 4 ref.

4554 Copper-Ethylenediaminetetraacetic Acid Somplex in Alkaline Solution. Harry Wagreich and Benjamin Harrow. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1925-1926.

Qualitative comparisons with Benedict's reagent. 10 ref.

4555 Crystallographic Data. LXXVI. Methylene-bis-(N-pyrrolidone-2-carboxylic Acid). Francis T. Jones, Kenneth J. Palmer, and Dale R. Black. *Analytical Chemistry*, v. 25, Dec. 1953, p. 1929-1930.

Includes table, diagrams, micrographs.

4556* Rapid Determination of Calcium and Magnesium in Ore and Slag. (German.) G. Graue and A. Zöhler. *Angewandte Chemie*, v. 65, no. 21, Nov. 7, 1953, p. 532-533.

Discusses use of Komplexon method. Table. 4 ref.

4557* Analytical Determination of Diacetylene and Monovinyl Acetylene. (German.) R. Krüger and Therese Gössl. *Angewandte Chemie*, v. 65, no. 22, Nov. 1953, p. 557-560.

Discusses determination in mixture with other acetylenes by fine fractionating, determination of freezing point, or argentometric titration. Tables, graphs. 9 ref.

4558* Determination of the Weight and Size of Molecules in Solution. P. H. Given, S. M. Rybicka, and W. F. Wyss. *British Coal Utilisation Research Association, Monthly Bulletin*, v. 17, Sept.-Oct. 1953, p. 413-448.

Describes determinations by equilibrium, dynamic, and other methods. 186 ref.

4559* Light Scattering Measurements on Polydisperse Systems of Spherical Particles. E. Atherton and R. H. Peters. *British Journal of Applied Physics*, v. 4, Dec. 1953, p. 366-368.

Application of Debye's theory is discussed. Light scattering measurements have been made using some commercial dispersions. Graphs, tables.

4560* Acid-Base Titrations in Nonaqueous Solvents. (German.) G. Glöckner. *Chemische Technik*, v. 5, no. 11, Nov. 1953, p. 634-640.

Presents a literature review and practical applications. Diagrams. 52 ref.

4561 Microcombustion. Developments in the General Electric Research Laboratory. E. W. Balis. *Engineering Experi-*

ment Station News (Ohio State University), v. 25, Dec. 1953, p. 38-44.

Describes equipment for analyzing small samples. Typical applications are included. Photographs, diagrams, tables. 6 ref.

4562* Rapid Determination of Ash in Coal and Coke. (Japanese.) Jiro Nitatori. *Fuel Society of Japan, Journal*, v. 32, no. 317, Sept. 1953, p. 503-506.

Twenty six fuels were tested. In each test differences of results between rapid and standard muffle method in ash determination did not exceed 0.5%. Diagrams.

4563 Analysis for Industry. II. M. Kapel. *Industrial Chemist and Chemical Manufacturer*, v. 29, Dec. 1953, p. 573-576.

Presents monthly review of specialized methods and techniques relating to determination of Al including use of NaF, organic reagents, determination of small quantities, and new reagents. 86 ref.

4564* Paper Chromatography of Quaternary Ammonium Bases and Related Compounds. Herta M. Bregoff, Eugene Roberts, and C. C. Delwiche. *Journal of Biological Chemistry*, v. 205, Dec. 1953, p. 565-574.

Paper chromatography, both alone and in conjunction with Reinecke fractionation, has been adapted to study of methylated nitrogenous bases in plant and animal tissues. Table, diagrams. 17 ref.

4565* Isotopic Analysis of Lead by Means of the Mass Spectrometer. I. Preparation of Tetramethyl Lead. (French.) G. Ducheylard, B. Lazard, and E. Roth. *Journal de chimie physique*, v. 50, no. 10, Oct. 1953, p. 497-500.

A simple and rapid adaptation of a classic method of preparing a few mg. of $Pb(CH_3)_4$ is described. Conditions of best yield are studies as well as possible fractionation of Pb isotopes during preparation. Table, diagrams, graphs. 15 ref.

4566* Colorimetric Estimation of Copper Using Rubeanic Acid. P. B. Janardhanan. *Journal of Scientific & Industrial Research*, v. 12, sec. B, Nov. 1953, p. 514-517.

Upper limit of Cu that can be estimated with a high degree of accuracy, employing rubeanic acid and a 390 mμ. filter, is 5 p.p.m. Graphs, table. 11 ref.

4567 A Simple Mass Spectrometer for Analysis of Stable Tracer Elements. E. H. Cooke-Yarborough and M. C. B. Russell. *Journal of Scientific Instruments*, v. 30, Dec. 1953, p. 474-480.

Some features are described of a 180° mass spectrometer designed for isotope abundance measurement. Diagrams, photograph. 6 ref.

4568* The Properties and Uses of Boron Trichloride. *Laboratory Practice*, v. 2, Dec. 1953, p. 661-663.

61 ref.

4569* Determining the Oxygen in Lead and Zinc. (German.) J. Maatsch. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 873-874.

Describes and critically evaluates hydrogen-reduction and hot-extraction methods of analyzing Pb and Zn for O. Diagrams, graphs, tables. 10 ref.

4570 A Rapid Polarographic Method for the Analysis of Tungsten-Cobalt Alloys. I. A. Bucklow and T. P. Hoar. *Metallurgia*, v. 48, no. 290, Dec. 1953, p. 317-318.

Describes method involving dissolution in phosphoric acid and direct polarography of unseparated metals. Table. 4 ref.

4571 The Determination of Boric Acid in Nickel Plating and Acid Zinc Plating Baths by Means of Cation Exchangers. Gunnar Gabrielson. *Plating*, v. 41, Jan. 1954, p. 47-48, 53-54.

Discusses theory, apparatus, and procedure. Tables. 5 ref.

4572* Microchemistry and Spectrum Analysis. (German.) Franz Pohl, *Spectrochimica Acta*, v. 6, no. 1, Nov. 1953, p. 19-21; disc., p. 21-22.

Discusses importance in solving analytical problems which neither chemical nor spectroscopic methods could solve separately.

4573* Spectrographic Analysis of Complex Oxides With Particular Reference to Slags and Ores. (English.) W. J. Price. *Spectrochimica Acta*, v. 6, no. 1, Nov, 1953, p. 26-37; disc., p. 37-38 + 1 plate.

A method for spectrographic analysis of slags, ores, refractories, and other simple or complex oxides is given. Tables, diagrams, photographs, graphs. 4 ref.

4574* Spectrochemical Analysis of Slags. (French.) Francesco Baldi. *Spectrochimica Acta*, v. 6, no. 1, Nov. 1953, p. 39-52.

Determination of SiO_2, CaO, MnO, and FeO is presented. Tables, graphs. 5 ref.

4575* The Use of Echelles in Spectroscopy. (English.) David Richardson. *Spectrochimica Acta*, v. 6, no. 1, Nov. 1953, p. 61-65; disc., p. 65 + 1 plate.

An echelle has properties intermediate between those of the reflection echelon and an echellete grating. Discusses use with either prism or grating cross dispersion to provide a spectrograph of moderate size with unusually high dispersion and resolving power for a wide range of spectra. Includes diagram, photographs. 3 ref.

4576* Results of Several Purity Tests With the Aid of Dielectrometric Analysis. (German.) Gotthold Ebert. *Zeitschrift für analytische Chemie*, v. 140, no. 3, 1953, p. 161-166.

Continuous control of dielectric constants of the products of fractional distillation was shown to be effective in determining degree of purity. Tables. 31 ref.

4577* The Use of Alginic Acid as Cation Exchanger in Analysis. (German.) H. Specker and H. Hartkamp. *Zeitschrift für analytische Chemie*, v. 140, no. 3, 1953, p. 167-170.

Iron was shown to be separated from other cations by exchange on alginic acid. Tables. 3 ref.

4578* Determining Tracers of Tungsten in Presence of Molybdenum. (German.) Arthur de Sousa. *Zeitschrift für Chemie*, v. 140, no. 3, 1953, p. 170-173.

Procedure of precipitating W and Mo in the form of tungstate and molybdate is described. Table. 12 ref.

4579* Colorimetric Determination of Tracers of Cobalt With β-Nitroso-α-Naphthol. (German.) H. Baron. *Zeitschrift für analytische Chemie*, v. 140, no. 3, 1953, p. 173-184.

Disturbing effects of large amounts of Fe, Cu, and Mn are avoided by this method. Tables. 10 ref.

4580* The Isolation of Lithium Rhenide. (English.) A. v. Grosse. *Zeitschrift für Naturforschung*, v. 8b, no. 10, Oct. 1953, p. 533-536.

Studies are reported on preparation, concentration, and isolation. 16 ref.

See also:
5565 (toxicological analysis by spectrophotometric methods)

CHEMISTRY—ORGANIC

4581* Calculating Glycol Hygroscopicity. William T. Diefenbach. *American Ink Maker*, v. 32, Jan. 1954, p. 27-29, 31, 67.

Method is given for calculating amount of water absorbed by glycols to arrive at glycol-water system equilibrium at common atmospheric temperatures and relative humidities. This is accomplished by development and use of fundamental key hygroscopicity curves unique to each glycol. Graphs, table. 2 ref.

4582* The Technology of the Phthalocyanines. I. Their Chemistry. Robert E. Brouillard. *American Ink Maker*, v. 32, Jan. 1954, p. 32-35, 65.

Metallic and nuclearly substituted phthalocyanine derivatives, synthetic methods, and determination are discussed. Micrograph, diagram. (To be continued.)

4583* New Method for Hydroxylating Long-Chain Unsaturated Fatty Acids, Esters, Alcohols, and Hydrocarbons.

Chemistry—Organic

H. B. Knight, R. E. Koos, and Daniel Swern. *American Oil Chemists' Society, Journal*, v. 31, Jan. 1954, p. 1-5.

Describes method involving addition of formic acid at its boiling point to double bond followed by hydrolysis of intermediate formate esters. Table. 12 ref.

4584* Highly Unsaturated Fatty Acids. II. Fractionation by Urea Inclusion Compounds. Ahmed M. Abu-Nasr, William M. Potts, and Ralph T. Holman. *American Oil Chemists' Society, Journal*, v. 31, Jan. 1954, p. 16-20.

Includes graphs, tables. 14 ref.

4585* Evidence for Hydroperoxide Formation in the Autoxidation of Methyl Linolenate. O. S. Privett, Christense Nickell, Wesley E. Tolberg, Raymond F. Paschke, Donald H. Wheeler, and W. O. Lundberg. *American Oil Chemists' Society, Journal*, v. 31, Jan. 1954, p. 23-27.

Discusses methods and results of experimental studies. Tables, graphs. 15 ref.

4586* Preparation of Aldehydes From Carboxylic Acids. III. (German.) F. Weygand, G. Eberhardt, H. Linden, Friedrich Schäfer, and Irene Eigen. *Angewandte Chemie*, v. 65, no. 21, Nov. 7, 1953, p. 525-531.

Reactions with $LiAlH_4$ were studied on 26 examples and applied on various acids. Tables, graphs. 37 ref.

4587 Irradiation of One Molar Aqueous Chloral Hydrate Solution With Co^{60}-Gamma-Rays and Betatron X-Rays. G. R. Freeman, A. B. Van Cleave, and J. W. T. Spinks. *Canadian Journal of Chemistry*, v. 31, Dec. 1953, p. 1164-1172.

Production of acid by irradiation of 1 *M* chloral hydrate solutions is proportional to the dose at a given dose rate. Tables, graphs. 9 ref.

4588 Some Fatty Acids of Peanut, Hickory, and Acorn Oils. C. Y. Hopkins and Mary J. Chisholm. *Canadian Journal of Chemistry*, v. 31, Dec. 1953, p. 1173-1180.

Methods of determining acids are described. Data on composition of oils is given. Tables, graph. 12 ref.

4589 The Structure and Grignard Reaction of the Beta-Aminocrotononitrile. Jaspar J. Conn and Alfred Taurins. *Canadian Journal of Chemistry*, v. 31, Dec. 1953, p. 1211-1222.

Includes diagrams, tables, graphs. 18 ref.

4590 Telomeric Reactions of Ethylene and Alcohols. E. R. Gilliland and R. J. Kallal. *Chemical Engineering Progress*, v. 49, Dec. 1953, p. 647-652.

Describes continuous high pressure system which was constructed for studying solvent polymerization of ethylene. Diagrams, tables, graphs, photograph. 4 ref.

4591 The Dehydrocyclization Reaction. Corwin Hansch. *Chemical Reviews*, v. 53, Dec. 1953, p. 353-396.

Considers "vapor-phase" dehydrocyclization reaction from viewpoint of the synthetic chemist. Consideration is limited to those reactions which are brought about in the "vapor phase" either catalytically or by simple pyrolysis. Diagrams, tables. 166 ref.

4592 The Parachors of Organic Compounds. An Interpretation and Catalogue. Osborne R. Quayle. *Chemical Reviews*, v. 53, Dec. 1953, p. 439-589.

Includes tables, diagrams. 325 ref.

4593* Alkylation of Isopentane by Isopropyl Chloride and Tertiary Butyl Chloride in Presence of Sulfuric Acid. (Russian.) B. A. Krentsel, A. V. Topchiev, and L. N. Andreev. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 319-322.

Experimental results are presented. Table, graphs. 7 ref.

4594* Isomerization of Unsaturated Hydrocarbons Containing C_{12} to C_{18}. (Russian.) A. A. Petrov. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 329-331.

Aluminum oxide activated by saturation of 1 N HCl was used as catalyst for study of high molecular olefins. Table. 4 ref.

4595* Extraction of Diphenylsilanediol. (Russian.) N. S. Nametkin, A. V. Topchiev, and F. F. Machus. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 495-497.

Studies were made of diphenylsilanediol, diphenyldibromosilane, and diphenyldiethoxysilane. Tables. 7 ref.

4596* Interaction of Unsaturated Silicon Hydrocarbons With Dialkyldithiophosphoric Acids. (Russian.) A. D. Petrov, V. F. Mironov, and V. G. Glukhovtsev. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 499-501.

Investigation of union with vinyl- and allyl-silanes was made. Table. 8 ref.

4597* The Alginates. R. W. Moncrieff. *Export Review*, v. 14, Dec. 1953, p. 21-24.

Discusses chemical extraction and structure and application. Photographs. 4 ref.

4598 Solutions of Chain Molecules—A New Statistical Theory. H. C. Longuet-Higgins. *Faraday Society, Discussions*, no. 15, 1953, p. 73-80.

Discusses the problems associated under calculating the free energy of mixing of solutions containing long-chain molecules.

4599 Thermodynamic Properties of Alcohol Solutions. J. A. Barker, I. Brown, and F. Smith. *Faraday Society, Discussions*, no. 15, 1953, p. 142-150.

New liquid-vapor equilibrium data for the system ethanol + carbon tetrachloride are presented and used to derive values of changes in free energy, heat, and entropy on mixing. Tables, graphs. 12 ref.

4600* Studies on Tar Pitch. XIII. Magnetic Properties of Pitches. (Japanese.) Shoichi Kikkawa, Hidemasa Honda, and Koji Ouchi. *Fuel Society of Japan, Journal*, v. 32, no. 318, Oct. 1953, p. 535-541.

Magnetic properties of pitches were determined by Gouy method. From these data and other properties of samples some calculations were made about relation between degree of thermal cracking and properties of the pitches. Tables, graphs.

4601* Synthetic Experiments in the Benzopyrone Series. XXXVI. Nuclear Methylation of Nor-Eugenin and Chrysin, and Synthesis and Study of Related C-Methyl Compounds. S. K. Mukerjee and T. R. Seshadri. *Indian Academy of Science, Proceedings*, v. 38, sec. A, Sept. 1953, p. 207-219.

23 ref.

4602* Raney Nickel Reductions. IV. Thioindigo Dyes, Thionaphthenes, and Thiofluorenes. G. N. Kao, B. D. Tilak, and K. Venkataraman. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Sept. 1953, p. 244-256.

Discusses desulphurization of indigoid dyes and of heterocyclic compounds containing sulphur. Diagrams. 12 ref.

4603* Thiophenes and Thiapyrans. XI. A New Route to Polycyclic Thiophenes. K. Rabindran and B. D. Tilak. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Oct. 1953, p. 271-276.

Synthesis of polycyclic thiophenes starting from aryl thiols and 2-bromo-1-tetralone is described. Diagrams. 7 ref.

4604* Anthraquinone and Anthrone Series. XII. The Benzanthrone Condensation on 2-Chloroanthraquinone. P. N. Pandit, B. D. Tilak, and K. Venkataraman. **XIII. Synthesis of 5-Substituted Benzanthrones.** S. S. Malhotra, B. D. Tilak, and K. Venkataraman. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Nov. 1953, p. 355-366.

Discusses experimental procedure and results. Table. 21 ref.

4605 The Reactions of Dyestuffs Chemistry. W. Bradley. *Industrial Chemist and Chemical Manufacturer*, v. 29, Dec. 1953, p. 563-568.

Discusses oxidation, reduction, and scission processes; additive, replacement, and substitution reactions; and heterocyclic and homocyclic syntheses. 28 ref.

4606* Study of the Solutions of the Perchlorvinyl Resin. (Russian.) A. N. Bykov and A. B. Pakshver. *Kolloidnyi Zhurnal*, v. 15, no. 5, Sept.-Oct. 1953, p. 321-330.

Includes tables, graphs. 6 ref.

4607* The Synthesis of Adrenocortical Hormones. I. C. A. Finch. *Manufacturing Chemist*, v. 24, Dec. 1953, p. 509-514.

Presents survey of three methods for total synthesis of cortisone. Photographs. 42 ref.

4608 Rotational Isomerism of 1,2-Dichlorethane and 1,2-Dibromoethane. Yu. A. Pentin, Ya. S. Bobovich, D. B. Gurevich, and V. M. Tatevsky. *National Science Foundation Translation*, no. 38, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 435.)

Study of phenomena was made for clarification of the structure of molecules and of their energy properties; for precise computation of thermodynamic functions; and calculation of chemical equilibria. Tables, graphs. 15 ref.

4609* The Reaction Between Styrene and Unsaturated Fatty Acids. II. S. Kut. *Paint and Varnish Production*, v. 43, Dec. 1953, p. 33-35, 60.

Method is described for separating free polystyrene from styrene copolymer drying oil fatty acids and non-styrenated drying oil fatty aicds. 18 ref.

4610 "Rocket Water" Yields New Wonder Products. Herbert Yahraes. *Popular Science*, v. 163, Dec. 1953, p. 145-149, 262.

Hydrazine, its derivatives, and uses are presented. Photographs, diagram.

4611 Electrochemical Fission of Carbon-Halogen Bonds. Philip J. Elving. *Record of Chemical Progress*, v. 14, no. 3, 1953, p. 98-115.

Presents discussion of advantages of electrochemical methods of investigation not only for synthesis but also for applicability to study of factors affecting chemical reactivity and reaction mechanisms. Graphs, table. 30 ref.

4612* Review of the Isomerization of Olefins. (Italian.) A. Camisa. *Rivista dei Combustibili*, v. 7, no. 10, Oct. 1953, p. 666-669.

Presents a brief survey of work and accomplishments. Discusses use of alumina, aluminum sulfate, clays, phosphoric acid, and silicate compounds as catalysts.

4613* A Study of the Alkaline Nitrobenzene Oxidation of Chlorite Lignin. Jack E. Jayne. *Tappi*, v. 36, Dec. 1953, p. 571-576.

Presents results of experimental studies. Tables. 20 ref.

4614* Starch Studies. IV. Concepts of Structure. V. Alkali and Acid Processes of Starch Fractionation. VI. Characterization of Fractionation Products. VII. Properties of Starch Solutions and the Kinetics of Starch Disaggregation. Albert W. Bauer and Eugene Pacsu. *Textile Research Journal*, v. 23, Dec. 1953, p. 853-877.

Includes diagrams, tables, graph. 72 ref.

4615* Progress in the Field of Divinyl Chemistry. (Russian.) A. A. Petrov. *Uspekhi Khimii*, v. 22, no. 8, Aug. 1953, p. 905-947.

Discusses obtaining and polymerization of divinyl. Describes application to rubber synthesis and properties of significance in theory of organic chemistry. 701 ref.

4616* Azulenes. (Russian.) M. Gordon. *Uspekhi Khimii*, v. 22, no. 8, Aug. 1953, p. 948-1001.

Presents a literature review. Discusses some unpublished works. Graphs, tables, diagrams. 226 ref.

4617* Alkali Derivatives of Polyvinyl Alcohol. (Russian.) S. N. Ushakov and E. M. Lavrent'eva. *Zhurnal Prikladnoi Khimii*, v. 26, no. 9, Sept. 1953, p. 960-968.

Describes action of aqueous solutions of caustic soda. Product is analogous to the alkali derivative of cellulose. Tables, graph, photograph. 7 ref.

See also:
4672 (diffusion of polystyrene)
4790 (nucleation in dielectrics)

CHEMISTRY—PHYSICAL

4618* Surface-Active Properties of Salts of Alpha-Sulfonated Acids and Esters. A. J. Stirton, J. K. Weil, and R. G. Bistline, Jr. *American Oil Chemists' Society, Journal*, v. 31, Jan. 1954, p. 13-16.

Includes tables, graph. 16 ref.

4619* Comparative Detergency of Several Built Polyethenoxy Alkanoates. A. T. Ballun, J. N. Schumacher, G. E. Kapella, and J. V. Karabinos. *American Oil Chemists' Society, Journal*, v. 31, Jan. 1954, p. 20-23.

Discusses preparation, effect of ethenoxy chain length and fatty acid composition, and mechanism of ethenoxification. Table, graphs. 5 ref.

4720 Comparison of Free Fatty Acid Content and Melting Point Determination of Metallic Stearates. Martin L. Stumpf. *American Paint Journal*, v. 38, Dec. 28, 1953, p. 60, 62, 64, 66, 68.

Includes tables. 18 ref.

4621* The Formation Mechanism of Adsorbent and Catalytically Effective Aluminum Oxides. (German.) M. Prettre, B. Imelik, L. Blanchin, and M. Petitjean. *Angewandte Chemie*, v. 65, no. 22, Nov. 1953, p. 549-555.

Active phases for adsorption and catalysis can be detected thermographically, radiographically, and by examinations of specific surface and porosity. Tables, graphs, diagrams, photograph. 22 ref.

4622* Gas-Liquid Phase Equilibrium in the System Methanol-Hydrogen. A. Michels, W. de Graaff, and J. van der Somme. *Applied Scientific Research*, v. 4, sec. A, no. 2, 1953, p. 105-108.

Includes table, graphs.

4623* The Evaluation of Detergent Performance in Domestic Dishwashing. Clifford Pugh. *Applied Statistics*, v. 2, Nov. 1953, p. 172-179.

Describes development of a practical dishwashing test. Indicates how statistical techniques can assist in overcoming some of the limitations inherent in such tests. Graphs, tables, nomogram.

4624 The Decomposition of Crystalline Sodium Azide by X-Rays. H. G. Heal. *Canadian Journal of Chemistry*, v. 31, Dec. 1953, p. 1153-1163.

Yields of nitrogen gas, ammonia, and hydroxyl ion obtained when irradiated crystals are dissolved in water are proportional to total dose and independent of dose rate. Graphs. 11 ref.

4625 The Effect of Physical Adsorption on the Electrical Resistance of Active Carbon. W. W. Smeltzer and R. McIntosh. *Canadian Journal of Chemistry*, v. 31, Dec. 1953, p. 1239-1251.

Change of electrical resistance of active carbon rods due to reversible adsorption of vapors is described. Effects of six saturated hydrocarbons and ethyl chloride were studied. Graphs, tables. 19 ref.

4626 Device for Determining Conjugate Phase Compositions in Three-Component Systems. A. I. Johnson and T. W. Barry. *Canadian Journal of Technology*, v. 32, Jan. 1954, p. 17-21.

Method is based on use of a mechanical gadget in conjunction with the synthetic method of analysis. Diagrams, tables. 3 ref.

4627* Chemiluminescence. Edel Wasserman. *Chemistry*, v. 27, Dec. 1953, p. 26-32.

Experiments on production of light with least possible amount of heat. Photograph, tables. 8 ref.

4628* Excitons in Cuprous Sulfate Crystals at Temperatures of Liquid Helium. (Russian.) E. F. Gross, B. P. Zakharchenia, and N. M. Reinov. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 265-267 + 1 plate.

Describes investigations of absorption spectrum in Cu_2SO_4. Tables, spectrograms. 4 ref.

Chemistry—Physical

4629* Experimental Determination of the Sequence of Elementary Reactions of Atoms and Radicals. (Russian.) L. I. Avramenko and R. V. Kolesnikova. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 349-352.

Theory of method was developed. Describes application on reaction of oxygen atoms with various molecules. Graphs. 3 ref.

4630* Catalytic Activity of Nickel, Palladium, and Platinum With Respect to Reaction of Hydrogen Oxidation. (Russian.) G. K. Boreskov, M. G. Slin'ko, and A. G. Filippova. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 353-355.

Specific activity was determined. Diagram, table. 2 ref.

4631* Effect of Pressure on Speed of Ionic Reactions of Isotopic Exchange. (Russian.) M. B. Neiman, M. G. Gonikberg, V. B. Miller, Iu. M. Shapovalov, and V. S. Zvezdkin. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 365-368.

Investigations were made of propyl iodide with iodine ions and of propyl bromide with bromine ions. Graphs, table. 8 ref.

4632* Calculation and Interpretation of Vibration Spectrums of the Dimer of Formic Acid and Its Deuteron Substitutes. (Russian.) L. M. Sverdlov. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 245-248.

Results of calculated and observed frequencies showed good agreement. Table. 10 ref.

4633* Catalysis and Adsorption During Dehydrogenation. (Russian.) A. A. Balandin. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 273-276.

Relationship between quasi-uniform dehydrogenizing catalytic surfaces was examined. Theoretical discussion.

4634* The Reaction of Ultrasonic Vibrations on Diffusion Processes. (Russian.) N. N. Dolgopolov, V. M. Fridman, and N. M. Karavaev. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 305-306.

Tests were made with a 10% $CuSO_4$ solution in 5% gelatin and compared with diffusion under various hydrodynamic test conditions. Tables, graph.

4635* Probability of the Formation of Crystalline Ice Grains in Supercooled Water. (Russian.) L. G. Kachurin. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 307-310.

Results indicate that all drops are cooled simultaneously but with various velocities. Graphs. 5 ref.

4636* The Acid Dissociation of the Aquoscandium Ions. II. Effect of Temperature and of Ionic Strength. Martin Kilpatrick and Lewis Pokras. *Electrochemical Society, Journal*, v. 101, Jan. 1954, p. 39-43.

First dissociation constant of hexaaquoscandium ion and dimerization constant for hydroxylpentaaquoscandium ion have been determined over temperature range 10 to 40 C in aqueous solutions, whose ionic strengths were adjusted with sodium perchlorate. From these data, approximate values of ΔH and ΔS have been calculated. Effect of electrolyte concentration on equilibrium constants is also reported. Tables, graphs. 7 ref.

4637* Equivalent-Circuit Model of the Transference Cell. George W. Murphy. *Electrochemical Society, Journal*, v. 101, Jan. 1954, p. 44-52.

An equivalent-circuit model characterized by remarkable pictorial simplicity is proposed for a cell with reversible electrodes in contact with a solution of a suitable binary electrolyte, nonuniform in concentration. Diagrams. 14 ref.

4638 Measurement of the Rates of Rapid Chemical Reactions. Frank H. Verhoek. *Engineering Experiment Station News (Ohio State University)*, v. 25, Dec. 1953, p. 31-38.

Describes equipment and techniques. Diagrams, graphs. 17 ref.

4639 Models and Molecules. Seventh Spiers Memorial Lecture. Joel H. Hildebrand. *Faraday Society, Discussions*, no. 15, 1953, p. 9-23 + 1 plate.

Discusses questions on solubility which involve behavior of molecules having features not considered in the models. Tables, photograph, graphs. 48 ref.

4640 The Statistical Mechanical Theory of Molecular Distribution Functions in Liquids. John G. Kirkwood and Zevi W. Salsburg. *Faraday Society, Discussions*, no. 15, 1953, p. 28-34.

Derivation of new system of integral equations for distribution functions by a method which does not depend upon the device of differentiation with respect to parameters in the potential of intermolecular force. 5 ref.

4641 Theoretical Models and Real Solutions. Robert L. Scott. *Faraday Society, Discussions*, no. 15, 1953, p. 44-51.

Various theoretical models of solutions (Hildebrand's regular solution, Guggenheim's strictly regular solution, Longuet-Higgins' conformal solution, and Prigogine and Mathot's cell model) are discussed and compared. 21 ref.

4642 The Vapour Pressures of Athermal Mixtures. G. S. Rushbrooke, H. I. Scoins, and A. J. Wakefield. *Faraday Society, Discussions*, no. 15, 1953, p. 57-65.

Demonstrates how mathematical framework of Mayer's theory of imperfect gases may be used to obtain information about partial vapor pressures of solutions. Tables, graphs. 6 ref.

4643 The Heat Capacities and Other Thermodynamic Properties of Some Binary Liquid Mixtures. L. A. K. Staveley, K. R. Hart, and W. I. Tupman. *Faraday Society, Discussions*, no. 15, 1953, p. 130-142.

Includes graphs. 25 ref.

4644 Thermodynamics of Binary Mixtures Containing Amines. J. L. Copp and D. H. Everett. *Faraday Society, Discussions*, no. 15, 1953, p. 174-188.

Study has been made of triethylamine + water, diethylamine + water, triethylamine + ethanol, and diethylamine + ethanol. Tables, graphs. 47 ref.

4645 The Interfacial Tension and Other Properties of the Cyclohexane + Aniline System Near the Critical Solution Temperature. Douglas Atack and O. K. Rice. *Faraday Society, Discussions*, no. 15, 1953, p. 210-218.

Includes tables, graphs, diagram. 11 ref.

4646 Ultrasonic Absorption in Binary Liquid Systems Near the Critical Solution Temperature. G. F. Alfrey and W. G. Schneider. *Faraday Society, Discussions*, no. 15, 1953, p. 218-225.

An investigation of nature of anomalous high acoustic attenuation in region of critical solution temperature of binary liquid system. Tables, graphs. 15 ref.

4647 The Solubility of Solids in Gases. A. H. Ewald, W. B. Jepson, and J. S. Rowlinson. *Faraday Society, Discussions*, no. 15, 1953, p. 238-243.

Discusses solubility of a solid in a compressed gas. Graphs. 12 ref.

4648* Raman Effect in Mixtures of Benzaldehyde With Alcohols and Phenol. P. G. Puranik. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Sept. 1953, p. 233-238 + 1 plate.

Results obtained in mixtures of benzaldehyde with alcohols and phenol are given with a view of similar effects due to hydrogen bond formation. Tables. 5 ref.

4649* Studies in Colloid Optics. IV. Sol-Gel Transition of Some Lyophilic Gels. P. K. Katti. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Nov. 1953, p. 387-397.

Investigations on changes in size of colloid particles during sol-gel transition of agar-agar, gelatin, and cellulose acetate gels, are discussed. Tables. 6 ref.

4650 The Action of Alkaline Detergents on Bottle Surfaces. N. A. Hurt, L. H. Myles, and R. Wallington. *Industrial Chemist and Chemical Manufacturer*, v. 29, Dec. 1953, p. 581-584.

Reports results of experimental studies with various detergent materials. Tests show that adverse effects caused by caustic soda may be minimized by silicates and phosphates of Na. Tables, photographs.

4651 Dielectric Polarization and Structure of Polar Liquids Under Pressure. Frank E. Harris, Ernest W. Haycock, and Berni J. Alder. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1943-1948.

Static dielectric constants of *n*-butyl alcohol, *t*-butyl alcohol, *n*-butyl chloride, *n*-butyl bromide, *t*-butyl chloride, and water were experimentally determined over a temperature range of 14 to 50 C and over a pressure range of 1 to 200 atmospheres. Tables, diagram. 21 ref.

4652 Heat Capacity of Chain Polymeric Crystals. W. H. Stockmayer and C. E. Hecht. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1954-1958.

A crude calculation of frequency spectrum and heat capacity has been made for a simple model of a large crystal composed of long parallel polymer chains. Heat capacity is very unlike that of a cubic crystal but can be represented quite well with a simple two-parameter equation recently proposed by Tarasov. Tables, graphs. 18 ref.

4653 Paramagnetic Resonance Absorption in Solutions of K and Na in Liquid NH_3. Clyde A. Hutchison, Jr. and Ricardo C. Pastor. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1959-1971.

Paramagnetic resonance absorption in solution of K and Na in liquid NH_3 has been investigated. Tables, graphs. 22 ref.

4654 Ground and Excited Electronic States and Molecular Vibrations of Some Polyatomic Molecules. Jules Duchesne and Louis Burnelle. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 2005-2008.

Vibration potential functions of electronic ground and excited states of molecules of C_{2v} and D_{3h} symmetry are computed and compared. Tables. 23 ref.

4655 Conjugation and the Intensity of the Infrared Carbonyl Band. Gordon M. Barrow. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 2008-2011.

Data are given for absolute intensities in chloroform and carbon tetrachloride solutions, and in the vapor state, of the carbonyl infrared absorption bands of a number of compounds in which the carbonyl group is conjugated by varying amounts. Tables, graph. 14 ref.

4656 A Study in the Mechanics of Crystal Growth From a Supersaturated Solution. G. C. Krueger and C. W. Miller. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 2018-2023.

An experimental investigation of concentration field during crystallization is made using an improved modification of W. F. Berg's interference technique. $Na_2S_2O_3 \cdot 5H_2O$ is crystallized at 23 C; concentrations between 40 and 55%. Graphs, table, diagram, micrographs. 16 ref.

4657 Calculation of the Heats of Formation of Gaseous Free Radicals and Ions. J. L. Franklin. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 2029-2033.

A simple method of calculating heats of formation of gaseous free radicals and carbonium ions is presented. Number of examples are given which show good agreement of calculated values with experiment. Tables. 11 ref.

4658 Exchange Between Rotational and Translational Energy in Gas Molecules. John C. Beckerle. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 2034-2041.

Rotational relaxation times for the gases H_2 and D_2 have been calculated with the quantum mechanical method of distorted waves using a one-dimensional collision model and an exponential repulsive interaction potential. Tables. 18 ref.

4659 The Kinetics of Adsorption From Solution to the Air/Water Interface. I. Normal Aliphatic Alcohols. II. Anionic and Cationic Soaps. A. M. Posner and A. E. Alexander. *Journal of Colloid Science*, v. 8, Dec. 1953, p. 575-592.

Surface potential technique has been used. Effects of concentration and temperature were determined. Tables, graphs. 10 ref.

4660 Donnan-E.M.F. and Suspension Effect. J. Th. G. Overbeek. *Journal of Colloid Science*, v. 8, Dec. 1953, p. 593-605.

Donnan potential used to determine particle charges is only justified when charge density on particles is small, so that all electrostatic and hydrodynamic interaction may be neglected. 26 ref.

4661 Effect of Pressure and Temperautre on Oil-Water Interfacial Tensions for a Series of Hydrocarbons. M. E. Hassan, R. F. Nielsen, and J. C. Calhoun. *Journal of Petroleum Technology*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 198, Dec. 1953, p. 299-306.

Interfacial tensions of benzene, propane, *n*-pentane, *n*-hexane, *n*-octane, and *iso*-octane against water were measured at temperatures ranging from 26 to 82 C and at pressures ranging from 1 to 204 atmospheres. Diagrams, table, graphs. 11 ref.

4662* The Structure of Cobalt Catalysts Supported on Diatomaceous Earth. Marvin F. L. Johnson and Herman E. Ries, Jr. *Journal of Physical Chemistry*, v. 57, Dec. 1953, p. 865-873.

Discusses results of investigation by means of various applications of physical adsorption techniques and by study of degree of reduction. Tables, graphs. 20 ref.

4663* Coagulation Effects of Aluminum Nitrate and Aluminum Sulfate on Aqueous Sols of Silver Halides in *Statu Nascendi*. Detection of Polynuclear Complex Aluminum Ions by Means of Coagulation Measurements. E. Matijevic and B. Tezak. *Journal of Physical Chemistry*, v. 57, Dec. 1953, p. 951-954.

Discusses experimental studies. Graphs. 11 ref.

4664* The Distortion of Aerosol Droplets by an Electric Field. Chester T. O'Konski and Henry C. Thacher, Jr. *Journal of Physical Chemistry*, v. 57, Dec. 1953, p. 955-958.

Presents theoretical analysis. Tables. 11 ref.

4665* Polarographic Studies in Non-Aqueous Media. I. Formamide. Harry Letaw, Jr. and Armin H. Gropp. *Journal of Physical Chemistry*, v. 57, Dec. 1953, p. 964-965.

Discusses experimental studies. Tables. 6 ref.

4666* Study of Photodisintegrations by Means of Photographic Emulsions. I. Experimental Apparatus and Preliminary Measurements. (French.) Raymond Chastel. *Journal de physique et le radium*, v. 14, no. 12, Dec. 1953, p. 707-716.

Describes accelerator tube and experimental apparatus for irradiation of photographic emulsions. Discusses source and conditions of γ-radiation; preparation of targets; choice and development of emulsions; and photographic plates. Diagrams, graphs, photographs. 22 ref.

4667* Raman Spectra and Structure of the Crystals of Copper Chloride and Double Copper Chlorides and Alkaline Metals. (French.) Jean-Paul Mathieu ad Lucienne Couture-Mathieu. *Journal de chimie physique*, v. 50, no. 10, Oct. 1953, p. 573-579.

Frequency and type of symmetry of Raman rays were studied. Comparison of simple salt and double salts was made. Existence of $CuCl_2(OH_2)_2$ groups and determination of basic vibrations are discussed. Table, graphs. 10 ref.

4668* Nature of the Acclimatization Phenomenon During Coagulation of Hydrophobic Sols in Electrolytes. (Russian.) Iu. M. Glazman. *Kolloidnyi Zhurnal*, v. 15, no. 5, Sept.-Oct. 1953, p. 334-346.

Study of coagulation of sol of As_2S_3. Tables, graphs. 10 ref.

4669* Dielectric Properties of Water-Oil Type Emulsions During Flow. (Russian.) Iu. F. Deinega, A. V. Dumanskii, and O. D. Kurilenko. *Kolloidnyi Zhurnal*, v. 15, no. 5, Sept.-Oct. 1953, p. 361-364.

Includes diagrams, graph, tables. 3 ref.

4670* Method of Concentric Displacement During Investigation of Elasto-Plastic and Stability Properties of Pastes and Pseudo-Gels. (Russian.) K. I. Klimov and G. V. Vinogradov. *Kolloidnyi Zhurnal*, v. 15, no. 5, Sept.-Oct. 1953, p. 371-383.

Describes results of experimental study. Diagrams, graphs. 9 ref.

4671* Coagulation of Colloidal Solutions by Mixtures Containing a Potential Determining Electrolyte. (Russian.)

Chemistry—Physical

V. F. Ust-Kachkintsev. *Kolloidnyi Zhurnal*, v. 15, no. 5, Sept.-Oct. 1953, p. 394-400.

Includes graphs, table. 13 ref.

4672 The Diffusion of Polystyrene Fractions in Dichlorethane. V. N. Tsvetkov and S. I. Klenin. *National Science Foundation Translation*, no. 27, July 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 49.)

Describes study of polystyrene obtained by block polymerization of the monomer at 60 C. Graphs, table. 6 ref.

4673 Ferroelectric Properties of $BaTiO_3$-$PbZrO_3$ Solid Solutions. G. A. Smolensky, A. I. Agranovskaya, and N. N. Krainik. *National Science Foundation Translation*, no. 81, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 91, no. 1, July 1953, p. 55-58.)

Describes preparation of test specimens and course of experiments. Compounds were used because bi- and tetra-valent cations are simultaneously substituted. Graphs. 7 ref.

4674 Mechanism of Additive Coloration of Alkali Halide Crystals. L. M. Shamovsky, L. I. Rybakova, and M. I. Gosteva. *National Science Foundation Translation*, no. 82, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 91, 1953, p. 67-70.)

Absorption spectrum of alkali halide crystals colored in the vapors of alkali metals does not depend on characteristics of particular metal. Graphs. 6 ref.

4675 Structural Chemistry of Zirconium Compounds. Richard F. Skonieczny. *Record of Chemical Progress*, v. 14, no. 3, 1953, p. 143-149.

Includes diagrams. 31 ref.

4676 The Crystal and Molecular Structure of Perylene. D. M. Donaldson, J. M. Robertson, and J. G. White. *Royal Society, Proceedings*, v. 220, ser. A., Dec. 8, 1953, p. 311-321.

X-ray work was carried out by photographic methods, using Cu radiation. Diagrams, tables. 10 ref.

4677 The Kinetics of Hydrolysis. E. A. Moelwyn-Hughes. *Royal Society, Proceedings*, v. 220, ser. A, Dec. 8, 1953, p. 386-396.

Rates of hydrolysis of methyl chloride, methyl bromide, and methyl iodide have been measured in absence of vapor phase at 10° intervals between 30 and 90 C. In this region, energy of activation at first decreases with a rise in temperature, and then passes through a minimum value. Tables, graphs. 18 ref.

4678* Ionic Activity Measurements in Heterogeneous Systems. Philip F. Low. *Soil Science*, v. 77, Jan. 1954, p. 29-41.

Presents results of a theoretical and experimental investigation on measurement of ionic activities in colloidal suspensions. Graphs, table. 25 ref.

Books and Miscellaneous Publications

4679 (Theory and Distillation and Extraction of Liquids.) **Die Theorie der Destillation und Extraktion von Flüssigkeiten.** G. Kortüm and H. Buchholz-Meisenheimer. 381 p. 1952. Springer-Verlag, Berlin. (QD63.D6 K84t)

Covers graphic presentation of states of equilibrium of homogeneous and heterogeneous binary and ternary systems; principles of thermodynamics and systematics of mixed phases; coefficients of activity of binary and ternary systems; systems of limited mescibility; vapor-liquid equilibria; and separation of liquid mixtures.

See also:
4599 (thermodynamics of alcohol solutions)
5389 (surface reactions)

COATINGS

4680* Phosphate Coating of Aluminum. (German.) H. Ketterl. *Aluminium*, v. 29, no. 12, Dec. 1953, p. 509-513.

Interrelation of protective layer and temperature of bath is described. Composition and quality of layers are discussed. Tables, graphs. 4 ref.

4681* How To Make Steel Last Three Times as Long. Fred B. Shaw. *American Machinist*, v. 97, Dec. 21, 1953, p. 97-99.

Ceramic coatings help protect against "hot spots" when metals are exposed to high temperatures and produce a surface smoothness that has minimum resistance to flow of hot gases. Photographs.

4682 Fundamentals of Paint, Varnish and Lacquer Technology. Chapt. IX. Formulation. I. Elias Singer. *American Paint Journal*, v. 38, Dec. 28, p. 70, 72, 74, 76-79.

Includes diagrams. (To be continued.)

4683 Factors Influencing Premature Paint Peeling. *American Paint Journal*, v. 38, Jan. 11, 1954, p. 66-67, 70, 72, 74, 76, 78, 80, 82, 84-87.

Discusses nature of problem with particular reference to overcoming paint peeling on southern yellow pine. Photographs, diagrams. 6 ref.

4684 Methods for Using Zinc Economically in Hot-Dip Galvanizing. H. Rückemesser. *Henry Brutcher, Altadena, Cal., Translation no.* 2937, 7 p. (From *Draht (German Ed.)*, v. 2, no. 8, Aug. 1951, p. 221-222.)

Steps recommended for minimizing formation of dross and Zn ashes in hot-dip galvanizing and hints as to possibilities of recovering their Zn content right at galvanizing shop.

4685 Insulation of Electrical Sheets by Mica-Phosphate Coatings. A. Wüstefeld. *Henry Brutcher, Altadena, Cal., Translation no.* 3092, 6 p. (From *Werkstoffe und Korrosion*, v. 2, no. 1, 1951, p. 16-17.)

Discusses development of processes for insulating electrical sheets and drawbacks of insulation by paper or lacquer coatings. Describes fundamentals, advantages, and application of 'Micacid' insulating process. 2 ref.

4686 Canadian Erucic Acid Oils. IX. Thermal Polymerization of Rapeseed Oil. A. Zuckerman, R. P. A. Sims, and N. H. Grace. *Canadian Journal of Technology*, v. 32, Jan. 1954, p. 10-16.

Heating of rapeseed oil in an inert atmosphere at atmospheric pressure resulted in increases of refractive index, viscosity, and molecular weight, and a decrease in iodine value. Graphs, tables. 6 ref.

4687 Theory of Adherence of Enamel on Iron. A. Dietzel. *Ceramic Age*, v. 62, sec. 1, Dec. 1953, p. 17, 20, 21, 24, 38, 39. (Translated from *Sprechsaal*, v. 78, no. 5, 1945, p. 12.)

Discusses formation of iron oxide interface, formation of dendrites, theory of gripping, and electrochemical theory. Tables. 22 ref.

4688 Corn Products Controls Corrosion With Asphaltic Coating. *Chemical Processing*, v. 17, Jan. 1954, p. 72-79.

Discusses coating of steel structures and surfaces of equipment. Coating affords protection from effects of highly-corrosive, moist salt air and provides excellent insulation when impregnated with cork. Photographs.

4689* Vaporization of Metals and Metalloids in Vacuum. (German.) Hg. Laporte. *Chemische Technik*, v. 5, no. 11, Nov. 1953, p. 632-634.

Discusses general principles and rules for industrial vacuum vaporization. Describes a small laboratory vacuum vaporization plant. Tables. 4 ref.

4690* Procelain Enamels and Ceramic Coatings, Prime Inhibitors of Metal Corrosion. Dwight G. Bennett. *Corrosion*, v. 10, Jan. 1954, p. 13-20; disc., p. 20.

Presents and evaluates test methods. Discusses some examples of coating effectiveness and areas in which coatings could be used to advantage. Photographs, tables, graphs.

4691 Some Factors in Spray-Silvering. P. B. G. Upton, G. W. Soundy, and G. E. Busby. *Electrodepositors' Technical Society, Journal*, v. 28, 1951-1952, p. 103-113 + 1 plate.

Refers to a particular process developed for use in electrotyping and employing a solution of formaldehyde for reduction of silver ammonic-nitrate solution. Essentials of present method are briefly described. Tables, graphs. 9 ref.

4692 The Properties of Metallic Coatings Produced by Evaporation and Sputtering. S. Tolansky. *Electrodepositors' Technical Society, Journal*, v. 28, 1951-1952, p. 155-165.

Similarity of metal films produced by cathodic sputtering and by thermal evaporation are discussed. Diagrams, graph, photograph.

4693 Practical Considerations in the Application of Vacuum Coating for Metal Finishing. L. Holland. *Electrodepositors' Technical Society, Journal*, v. 28, 1951-1952, p. 167-178; disc., p. 187-193 + 4 plates.

Includes diagrams, graph. 8 ref.

4694 Lacquering to Obtain Brilliance and Metallic Lustre. H. H. Vevers and G. E. Gardam. *Electrodepositors' Technical Society, Journal*, v. 28, 1951-1952, p. 179-186; disc., p. 187-193.

Types of lacquer used for base and top coats are discussed, together with methods of application and stoving. Graphs, diagram.

4695 Porosity of Sprayed Coatings. II. Mechanical Treatments and Lubrication. D. de Paauw. *Electroplating and Metal Finishing*, v. 6; *Metal Spraying*, v. 3, Dec. 1953, p. 475-476.

Deals with effect of mechanical treatments such as grinding and polishing and function of porosity in use of metal-sprayed bearing parts. Graph, tables. (To be concluded.)

4696 Spray Equipment. William Beacham. *Industrial Finishing*, v. 30, Dec. 1953, p. 26-28, 30, 32.

Discusses spray guns, circulating paint systems, hose, hose connections, and spray booths. Photographs.

4697 From Hot Spray to Airless Spray. James A. Bede. *Industrial Finishing*, v. 30, Dec. 1953, p. 40, 42, 44, 46.

Discusses role of paint heaters in hot spray painting. Describes development and advantages of airless spray process. Photographs.

4698 New Corrosion Resistant Coating Protects Cast Iron Coolers. J. J. Obrzut. *Iron Age*, v. 172, Dec. 24, 1953, p. 76-77.

Cooling and condensing sections are being protected with a special Al coating. Coating is a mixture of Al powder in a special plastic vehicle. Photographs.

4699 Plating Tin on Aluminium. J. M. Bryan. *Metal Industry*, v. 83, Dec. 4, 1953, p. 461-463.

Presents results of studies which were undertaken to ascertain whether a satisfactory deposit of Sn could be formed by simple chemical displacement which would serve either by itself as a surface finish for Al or as a base for soldering and electroplating. Table. 14 ref. (To be concluded.)

4700 Plating Tin on Aluminium. J. M. Bryan. *Metal Industry*, v. 83, Dec. 18, 1953, p. 502-504.

Deals with attempts to obtain by simple immersion a satisfactory deposit of Sn on Al. Tables, graph.

4701* Surface of Sheet Metal and Pot Galvanizing. (German.) H. Bablik. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 849-851.

Experiments have shown that any disturbance of surface grain of Fe greatly increases pick-up of Zn and loss of Fe. Discusses use of flux to reduce loss of Fe. Diagrams, tables, micrographs. 5 ref.

4702* Examples on the Application of the Spray Method of Zinc Coating in Germany. (German.) R. Weber. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 852-854.

Discusses principle, application, and effectiveness as a rust preventive. Photographs, tables. 3 ref.

4703* Effect of Pickling and Steam Treatment on Corrosion Resistance of Aluminum. (German.) H. Neunzig. *Metalloberfläche*, Ausgabe B, v. 5, no. 12, Dec. 1953, p. 181-184.

Results of numerous tests show that Al ware is best pickled in an acid mixture. Exposure of bright Al to steam was shown to prevent discoloration and increase corrosion resistance. Tables, photographs. 5 ref.

4704* The Use of Silicones in Treatment of Metal Surfaces. (German.) Fritz Ohl. *Metalloberfläche*, Ausgabe A, v. 7, no. 12, Dec. 1953, p. 185-188.

Discusses mechanical and chemical properties which make silicones valuable as corrosion inhibitors, high-temperature lubricants, paints, polishes, and cements.

4705* A Method of Producing Uranium Oxide Films on Aluminum. (German.) Siegfried Skorka. *Naturwissenschaften*, v. 40, no. 23, 1953, p. 605.

A simplified procedure is described. Graph.

4706* Water Dispersed Paint Systems. *Official Digest. Federation of Paint and Varnish Production Clubs*, 1953, no. 347, Dec., p. 904-932; disc., p. 932-939.

Round table discussion at Federation of Paint and Varnish Clubs 31st Annual Meeting, Atlantic City, Oct., 1953. Includes "Introduction", William J. Greco; "Consumers' Reactions", Herbert E. Hillman; "Manufacture", Edward C. Scholl; "Pigment Dispersions", Waller H. Hoback; "New Acrylic Resin Dispersions", N. J. Timmons; and "Binders", Henry F. Payne. Tables, formulas. 9 ref.

4707 Here's How Interstate Lines Pipe in Place to Prevent Internal Corrosion. M. B. Grove. *Oil and Gas Journal*, v. 52, Jan. 18, 1954, p. 109-110.

Discusses technique of in-place plastic lining of pipe. Diagram.

4708 1953—A Year of Accomplishment. H. Preuss. *Organic Finishing*, v. 14, Dec. 1953, p. 6-11.

Review of industrial developments in the finishing field. Discusses metal cleaning, new coatings, special decorative finishes, application methods, corrosion, and miscellaneous products. Photographs.

4709 Protective Coatings and Linings for Water Treating Equipment. James Boyd Smith. *Organic Finishing*, v. 14, Dec. 1953, p. 12-16.

Discusses some types of water treatment in current use and corrosion prevention measures employed. Photographs. (To be continued.)

4710* Improved Drying Oils. R. L. Terrill. *Paint Industry Magazine*, v. 68, Dec. 1953, p. 15-24.

Reviews chemical properties of drying oils. Discusses importance of properties for proper utilization. Diagrams, graphs. 11 ref.

4711 The Effect of Driers on the Properties of Alkyd Resin Finishes. IV. Conclusions. *Paint Manufacture*, v. 23, Dec. 1953, p. 403-406, 409.

Discusses gas checking and wrinkling problems. Photographs.

4712* Isocyanates, a Staff Report. *Paint, Oil & Chemical Review*, v. 116, Dec. 17, 1953, p. 28-30.

Discusses chemistry, polymerization reactions, general applications, and applications to protective coatings. 8 ref.

4713* Formulation and Manufacture of Interior Flat Latex-Emulsion Wall Paints. J. P. Davis. *Paint, Oil & Chemical Review*, v. 117, Jan. 14, 1954, p. 22, 24, 26, 28-30, 32-33.

Classes of pigments used and color formulas are given. Tables. 7 ref.

4714* Solubility Factor in Metal Phosphate Pre-Treatments. Max Kronstein, Philip Hixon, and Jack Granowitz. *Paint and Varnish Production*, v. 43, Dec. 1953, p. 19-30.

Presents a study of metal-phosphate coatings on steel as a base for paint application. Graphs, tables, photographs, diagram. 4 ref.

4715 Special Coatings for Metals Used at High Temperatures. A. H. Sully. *Product Engineering*, v. 25, Jan. 1954, p. 135-141.

Covers diffusion, refractory, and low emissivity coatings. Photographs, graphs. 3 ref.

4716* The Scope of Hot Spraying. H. J. Testro. *Product Finishing*, v. 6, Dec. 1953, p. 48-55.

Theory and practice of hot spraying is reviewed. Benefits and limitations are discussed. Photographs.

Coatings

4717* Technical Problems in the Finishing Shop. I. Paint Mixing in the Enamelling Shop. E. E. Halls. *Product Finishing*, v. 6, Dec. 1953, p. 72-79.

Includes diagrams, tables.

4718* Review of Spray Guns. *Product Finishing*, v. 6, Dec. 1953, p. 93-102.

Assists firms in making a choice of most suitable types for their particular applications. Photographs.

4719* Spotlighting Finishing Progress. Animal Fats in Hot-Dip Tinning. C. Fred Gurnham. *Products Finishing*, v. 18, Jan. 1954, p. 48, 50, 52, 54, 56, 58, 60, 62, 64.

Discusses requirements for tinning oils. Reports progress on development of substitutes for imported palm oil. Diagram.

4720 Clad Metals and Clad Metal Processing. Walter L. Keene. *Steel Processing*, v. 39, Dec. 1953, p. 647-653.

Discusses methods of cladding including pressing, casting, direct rolling, sintering, deposition. Diagrams, photographs, micrographs.

4721* Esters of Distilled and Acid Refined Tall Oil as Varnish Vehicles. P. D. Patrick, Jr., M. G. Bestul, and Robert W. Gressang. *Tappi*, v. 36, Dec. 1953, p. 561-564.

Presents comparison of methods. Discusses preparation of esters and varnishes. Describes film testing methods. Tables.

4722* Phosphate Coating as a Pre-Paint. Carl S. Rankin. *Western Machinery and Steel World*, v. 44, Dec. 1953, p. 98-100.

Treating metal surfaces with a phosphate coating, prior to painting, assures a good clean bond between surface and paint. Phosphating also reduces chemical reaction when protectiveness of paint is removed. Micrographs, photograph.

Books and Miscellaneous Publications

4723 Immersion Tinning. Frederick A. Lowenheim. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 429-434. 1953. John Wiley & Sons, Inc. New York. (TS670 G78.8m)

Discusses two important industrial uses of immersion tin coatings. The so-called "liquor finish" on steel wire and tinning of Al alloy pistons for internal combustion engines and tinning the inside of Cr tubing, which would not be susceptible to ordinary electroplating methods. Tables. 27 ref.

See also:
4737 (metallic and non-metallic coatings)
4742 (rust resisting pigment)
5583 (quality control in paint industry)
5661 (silvering in plastics)
5718 (rubber coatings for corrosion protection)
5836 (wood finishes)

CORROSION

4724* Stainless Steels of Austeno-Ferritic Structure. (English.) *Aciers Fins & Spéciaux Francais*, 1953, no. 13, Mar., p. 65-69.

Discusses corrosion resistance and mechanical properties. Photographs, tables.

4725* Mechanism of the Internal Corrosion of Water Pipe. Rolf Eliassen and James C. Lamb, III. *American Water Works Association, Journal*, v. 45, Dec. 1953, p. 1281-1294.

Discusses effects of several variables. Outlines requirements for further research. Diagrams, graphs, tables. 9 ref.

4726 Corrosion Behavior of Stainless Steels in Oxidizing Solutions. Corrosion in Chromic Acid Solutions. M. M. Kurtepov, G. V. Akimov, and N. N. Bardizh. *Henry Brutcher, Altadena, Cal., Translation no.* 3054, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 87, no. 4, 1952, p. 625-626.)

Discusses effect of steel composition, concentration of acid, and temperature of solution. Tables.

4727 Study of Process of Oxidation (Rusting) of Iron by Isotope Method. E. I. Dontsova. *Henry Brutcher, Altadena, Cal., Translation no.* 3073, 7 p. (From *Doklady Akademii Nauk SSSR*, v. 85, no. 1, 1952, p. 165-167.)

Discusses distribution of oxygen isotopes between water and oxidation products. Describes results of computations and their verification by experiment. Tables. 7 ref.

4728 High Silicon Irons. Walter A. Luce. *Chemical Engineering*, v. 61, Jan. 1954, p. 246, 248, 250, 252, 254, 256, 258, 260.

Describes corrosion resistance; mechanical and physical properties; and applications of Duriron and Durichlor. Photographs, tables, graphs.

4729* Atmospheric Rust Prevention. The Importance of Surface Pre-Treatment and Constructions Ready for Painting. (German.) H. W. Dunker. *Chemie-Ingenieur-Technik*, v. 25, no. 11, Nov. 1953, p. 641-650.

Discusses economical importance of pre-treatment of Fe surfaces. Tables, graphs, micrographs, diagrams, photographs. 24 ref.

4730* Corrosive Effects of Deicing Salts. Progress Report of NACE Technical Practices Committee 19 on Corrosion by Deicing Salts. *Corrosion*, v. 10, Jan. 1954, p. 3-6.

Reports deicing salt used in cities in Northern part of the U. S. is estimated to cause an added $100,000,000 annual loss to automobiles and buried pipes and cables. Describes methods of testing effect of salts on steel. Suggests mitigation practices. 21 ref.

4731* Corrosion by Acids at High Temperatures. R. F. Miller, R. S. Treseder, and A. Wachter. *Corrosion*, v. 10, Jan. 1954, p. 7-12; disc., p. 12.

Presents simple test method for obtaining corrosion data with acids and other corrosives at temperatures above their normal boiling points. Diagrams, tables, graphs. 4 ref.

4732* Corrosion Testing by Measurement of Local Cell Potentials. J. K. Rice. *Corrosion*, v. 10, Jan. 1954, p. 25-29; disc., p. 29.

Reviews method of measurement which uses rotating electrode and stationary micro-probe reference electrode. Diagrams, graphs, photographs. 4 ref.

4733* NBS Lab Corrosion Tests Yield 10-Year Field Data in Six Months. *Gas*, v. 30, Jan. 1954, p. 57-58.

Technique used should provide a valuable basis for predicting service of iron and steel structures exposed to various soils. Diagram.

4734* New Techniques and Current Problems in Control of Underground Corrosion. O. C. Mudd. *Gas Age*, v. 112, Dec. 17, 1953, p. 46-51, 77-78.

Taken from paper presented before Pipe Line Symposium, API., Chicago, Ill., Nov. 10, 1953. Discusses construction features, accessory equipment, and choice of coatings. Diagrams, graphs, table.

4735* Stray Current in Gas Lines in Berlin and Their Elimination. (German.) Manfred Dewitz. *Gas und Wasserfach*, v. 94, Ausgabe Gas, no. 23, Dec. 1, 1953, p. 689-692.

Establishes existence of stray current. Describes corrosion effects on joints and welds. Discusses precautions for electrochemical corrosion. Tables, photographs, graphs.

4736 Titanium Progress Report. Corrosion. Mars G. Fontana. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 103A-105A.

Developments needed for extensive use in chemical process industries are discussed. Table.

4737 The Protection of Iron and Steel by Metallic and Non-Metallic Coatings. II. J. C. Hudson and J. F. Stanners. *Iron and Steel Institute, Journal*, v. 175, Dec. 1953, p. 381-390 + 6 plates.

Second report on a series of tests on protection of structural steel by metallic coatings and by non-metallic coatings other than oil paints. Graphs, tables, photograph. 6 ref.

4738* Corrosion Resistance of Galvanized-Steel-Stitched Aluminum Alloys. *Light Metal Age*, v. 11, Dec. 1953, p. 28.

National Bureau of Standards investigation of corrosion resistance of sheets of unclad and Al clad 24S-T3 Al alloy stapled together with galvanized steel wire.

4739 New Heat Resistant Alloy. M. N. Ornitz and R. H. English. *Materials & Methods*, v. 39, Jan. 1954, p. 82-85.

Improved structural stability and resistance to oxidation make this Ni-Cr-Fe alloy suitable for service to 2200 F. Photographs, graphs, tables.

4740* Zinc for Roofs. (German.) B. Trautmann. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 843-846.

Shows that corrosion of Zn roofs depends largely on atmosphere. Discusses different designs. Photographs, diagram.

4741* The Service Life of Sheet Zinc for Roofs. (German.) H. Schneider. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 846-848.

Corrosion resistance of Zn roofs is discussed. Micrographs, photograph, tables.

4742* Lead Cyanamide, a Rust-Resisting Pigment. (German.) W. Roever. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 876-877.

Properties and uses are discussed.

4743* Lead as a Corrosion Inhibitor in the Manufacture of Chemical Apparatus. (German.) H. Hörger. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 878-880.

Shows that intercrystalline and stress corrosion are two factors which reduce wear resistance of Pb. Photographs, diagram.

4744* An Experiment on the Oxide Growth on Metals. (German.) B. Ilschner and H. Pfeiffer. *Naturwissenschaften*, v. 40, no. 23, 1953, p. 603-604.

Experimental results showed that an outward migration of cations was accompanied by a diffusion of oxygen. Micrographs. 12 ref.

4745* Boiler Feed Water Treatment for Advanced Steaming Conditions. J. Leicester. *Overseas Engineer*, v. 27, Jan. 1954, p. 206-211.

Reports results of research into factors leading to boiler corrosion and deposits. Presents recommendations for feed water conditioning. Diagrams, graphs. 8 ref.

4746 Five Steps to Lower Corrosion Costs. V. B. Guthrie. *Petroleum Processing*, v. 9, Jan. 1954, p. 72-74.

Includes diagram.

4747* Machine Tool Corrosion by Soluble Cutting Oils. I. *Product Finishing*, v. 6, Dec. 1953, p. 82-86.

Practical determination of extent of corrosion with a series of commercial soluble oils. Photographs, tables. 3 ref.

4748* Rust Hasn't a Chance. Carl O. Durbin. *SAE Journal*, v. 62, Jan. 1954, p. 30-33.

Based on paper "Corrosion Protection During Processing, Storage, and Shipment—Automotive Application" presented at SAE Summer Meeting, Atlantic City, June 8, 1953. Photographs.

4749* The Status of Fretting Corrosion. II. Mechanism, Identification and Prevention of Fretting. W. E. Campbell. *Scientific Lubrication*, v. 5, Dec. 1953, p. 18-22.

Presents classification of wear corrosion phenomena and discusses prevention. Photograph. 19 ref.

4750* Role of the Lead Dioxide Film During Corrosion of Lead Anode. (Russian.) G. Z. Kir'iakov and I. A. Korchmarek. *Zhurnal Prikladnoi Khimii*, v. 26, no. 9, Sept. 1953, p. 921-924.

Effects of alloying additions on corrosion resistance of Pb. Tables. 7 ref.

Books and Miscellaneous Publications

4751 Corrosive Action of Dissolved Gases on Steel in Water. J. Wade Watkins and Jock Wright. Paper from GENERAL PAPERS PRESENTED BEFORE THE DIVISION OF PETROLEUM CHEMISTRY. p. 5-13. Mar. 1953. American Chemical Society, Div. of Petroleum Chemistry, P.O. Box 427, Marcus Hook, Pa. (TP690 Am35g)

Evaluates comparative efficiencies of different methods used to condition and inject water, from the standpoint of minimizing corrosion and preventing plugging of producing formation of water-imput wells, and to investigate possibility of improving existing methods or of devising new ones. Diagram, graph, photograph. 8 ref.

4752 Symposium on Fretting Corrosion. ASTM Special Technical Publication no. 144. 84 p. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA462 Am35sf)

Consists of five papers, separately abstracted.

4753 The Current Status of Fretting Corrosion. W. E. Campbell. Paper from SYMPOSIUM ON FRETTING CORROSION. ASTM SPECIAL TECHNICAL PUBLICATION. no. 144. p. 3-19; disc., p. 19-23 + 1 plate. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA462 Am35sf)

General discussion of fretting wear of metal surfaces is presented. Methods of mitigating fretting are discussed. Suggestions for future research on the mechanism are given. Graph, micrographs, table. 46 ref.

4754 Fretting Corrosion Tendencies of Several Combinations of Materials. J. R. McDowell. Paper from SYMPOSIUM ON FRETTING CORROSION. ASTM SPECIAL TECHNICAL PUBLICATION no. 144. p. 24-39; disc., p. 82. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA462 Am35sf)

Combinations of materials, both metallic and nonmetallic, were subjected to conditions producing fretting corrosion in a effort to evaluate their comparative susceptibility to this action. Table is given listing results in three groups of relative resistance. Tables, photographs, diagram. 9 ref.

4755 Influence of Fretting Corrosion on the Fatigue Strength of Fitted Members. Oscar J. Horger. Paper from SYMPOSIUM ON FRETTING CORROSION. ASTM SPECIAL TECHNICAL PUBLICATION no. 144. p. 40-51; disc., p. 52-53. American Society for Testing Materials, Philadelphia 3, Pa. (TA462 Am35sf)

Paper discusses fundamental nature of the fatigue problem associated with fretting. Eight factors are separately treated as to how each one influences fatigue strength regarding both initiation and propagation of fatigue cracks. Photographs, graphs, tables. 24 ref.

4756 Effect of Lubricants in Minimizing Fretting Corrosion. E. W. Herbek, Jr. and R. F. Strohecker. Paper from SYMPOSIUM ON FRETTING CORROSION. ASTM SPECIAL TECHNICAL PUBLICATION no. 144. p. 54-66; disc., p. 67-70. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA462 Am35sf)

A survey of past work on effect of lubricants in minimizing fretting corrosion is presented. It is shown that investigators differ on corrective effect of specific lubricants. Tables, photograph. 20 ref.

4757 Test Equipment for Evaluating Fretting Corrosion. H. H. Uhlig, W. D. Tierney, and A. McClellan. Paper from SYMPOSIUM ON FRETTING CORROSION. ASTM SPECIAL TECHNICAL PUBLICATION no. 144. p. 71-78; disc., p. 79-81. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA462 Am35sf)

Test machine has been designed and constructed to measure fretting corrosion quantitatively under precisely defined conditions. Photographs, graphs, diagram. 11 ref.

4758 The Mechanism of Oxidation of Metals and Alloys at High Temperatures. Karl Hauffe. Paper from PROGRESS IN METAL PHYSICS. v. IV. p. 71-104. 1953. Interscience Publishers, Inc., New York. (TA459 C35p)

Presents new theoretical viewpoints on formation of scale on various metals.

See also:
4460 (corrosion of cements)
4685 (insulation of electrical sheets)

Corrosion

4698 (corrosion resistant coatings)
4703 (corrosion resistance of Al)
4818 (corrosion resistance of Cr plate)
4826 (individual reaction on metal-water boundary layer)
5173 (corrosion of pump materials)

ELECTRICAL ENGINEERING

4759 Measurements on Nonreciprocity in an Electromechanical System. L. J. Black and H. J. Scott. *Acoustical Society of America, Journal*, v. 25, Nov. 1953, p. 1137-1140.

Relations for a network, containing both electrostatic and electromagnetic coupling and having anti-reciprocal transfer characteristic, are developed. Diagrams, graphs. 9 ref.

4760* Blast Cooling of Electrical Machinery. A. C. Boswell. *Aircraft Engineering*, v. 25, Dec. 1953, p. 367-370.

Discusses use on airborne equipment. Graphs.

4761* The Transductor With A. C. High-Resistance Terminal of the Control Winding. (German.) Wulfo Schmidt. *Archiv der elektrischen Übertragung*, v. 7, no. 12, Dec. 1953, p. 574-578.

Operation of transductors with high- and low-resistance terminals is discussed. Diagrams. 3 ref.

4762 Lighting for Industrial Inspection. R. L. Zahour and M. E. Haskins, Jr. *Consulting Engineer*, v. 2, Dec. 1953, p. 37-41.

Discusses factors to be considered in selecting type of lighting. Photographs, diagrams, table.

4763* Electric Utilities Made Notable Gains in 1953 Operations. Walter H. Sammis. *Electric Light and Power*, v. 32, Jan. 1954, p. 64-68.

Postwar growth and service record of the electric industry is making noteworthy gains. Graphs.

4764* Thermistor Production. W. T. Gibson. *Electrical Communication*, v. 30, Dec. 1953, p. 263-270.

Commercial production and circuit applications of bead- and rod-types are discussed. Photographs.

4765* Two New Equations for the Design of Filters. Milton Dishal. *Electrical Communication*, v. 30, Dec. 1953, p. 324-337.

Equations for the nondissipative case specify exact element values required for filter to produce that attenuation shape having highest possible rate of cutoff. Tables, graphs. 11 ref.

4766* Motor Insulation Life as Measured by Accelerated Tests and Dielectric Fatigue. C. J. Herman. *Electrical Engineering*, v. 73, Jan. 1954, p. 33-37.

Consideration of heat, voltage, vibration, and humidity in life tests of small motors. Graphs, chart, tables, circuit diagram, photographs. 8 ref.

4767* Puncture Tests on Porcelain Distribution Insulators Using Steep-Front Voltage Surges. J. H. Park and H. N. Cones. *Electrical Engineering*, v. 73, Jan. 1954, p. 45-49.

Insulator failure by puncture could be obtained by repeated applications of a steeply rising voltage surge to test specimen. Photographs, circuit diagrams, tables, oscillograms.

4768 Research Progress in Dielectrics—1953. Alex E. Javitz. *Electrical Manufacturing*, v. 53, Jan. 1954, p. 88-94.

Reports on electrical degradation, breakdown, high-temperature problems, and studies in ferroelectrics. Purposes functional temperature classifications. Photograph, graphs, tables.

4769 Part-Winding Starting of Squirrel-Cage Motors. Marvin Brown. *Electrical Manufacturing*, v. 53, Jan. 1954, p. 108-113.

Discusses a design which requires little auxiliary equipment and provides excellent acceleration. Diagrams. 13 ref.

4770* Diagrams of High Voltage Long Distance Transmission Lines. (Russian.) D. I. Azar'ev, V. A. Venikov, and N. N. Sokolov. *Elektrichestvo*, 1953, no. 12, Dec., p. 3-10.

Describes behavior of lines with intermediate synchronous compensators. Discusses advantages. Tables, graphs, diagrams, oscillogram.

4771* Calculation of Currents and Voltages in Exciter Circuits During Forcing and De-Excitation. (Russian.) V. L. Inosov and L. V. Tsukernik. *Elektrichestvo*, 1953, no. 12, Dec., p. 20-26.

Discusses use of excitations with compounding devices and electromagnetic voltage correctors in high voltage generators. Diagrams, graphs, tables.

4772* Analytical Expression of the Regulation Characteristic of a Synchronous Non-Salient Pole Machine. (Russian.) V. V. En'ko. *Elektrichestvo*, 1953, no. 12, Dec., p. 31-35.

Gives an approximate expression of the characteristic from one point corresponding to rated rotor current. Graphs, tables.

4773* New, Simple, and Precise Method for the Calculation of Sag and Strength of Power Line Wires. (Hungarian.) Tibor Magyar. *Elektrotechnika*, v. 46, no. 12, Dec. 1953, p. 335-339.

Method is applicable to various types of conductors, spans, and levels. Table, diagram. 3 ref.

4774* Values of Neglections in the Calculation of Sags. (Hungarian.) István Dömök. *Elektrotechnika*, v. 46, no. 12, Dec. 1953, p. 339-341.

Discusses simplified calculations for amount of sag and stresses in power lines. Tables, diagram. 3 ref.

4775* Model Experiments on the Ventilation of Turbo Generators. (Hungarian.) Dénes Kerényi. *Elektrotechnika*, v. 46, no. 12, Dec. 1953, p. 341-347.

Experiments have shown that neither rotation nor elliptical shape of rotor influence distribution of cooling air. Proper distribution may be accomplished by providing adequate canals. Diagrams, graphs, photographs. 6 ref.

4776* Demonstration of Corona by Means of a Cathode Ray Oscilloscope. (Hungarian.) György Karády and András Csernátony-Hoffer. *Elektrotechnika*, v. 46, no. 12, Dec. 1953, p. 348-350.

Discusses use of oscillographical methods for determining tension at which corona discharge begins. Presents results of measurements carried out an overhead line fittings and transformers. Diagrams, oscillograms, graph, tables.

4777* Errors in the Curve Shapes of Rectifier Measuring Instruments. (German.) F. Kümmel. *Elektrotechnische Zeitschrift*, v. 74, Ausgabe A, no. 23, Dec. 1, 1953, p. 665-668.

Describes a multiple measuring device in which error of current division is nearly eliminated. Graphs, diagrams. 3 ref.

4778* Measuring Over Voltages and Shock Voltages With High Vacuum Tube and Electrostatic Voltmeter. (German.) W. Rabus. *Elektrotechnische Zeitschrift*, v. 74, Ausgabe A, no. 23, Dec. 1, 1953, p. 676-681.

Describes instruments for measuring high voltages. Discusses calibration and uses. Diagrams, photographs, graphs. 7 ref.

4779* Selection of Procedures, Protection and Cautions Related to the Starting of Synchronous Motors With Silencer Applied on Excitation. (Russian.) B. A. Kayzhanovskii. *Energeticheskii Biulleten*, 1953, no. 9, Sept. p. 1-7.

Discusses synchronous motors with their starting characteristics. Diagrams. 6 ref.

4780* Design and Construction of Electric Supply for Petroleum Industry. (Russian.) A. N. Glazkov and N. M. Movsesov. *Energeticheskii Biulleten*, 1953, no. 9, Sept., p. 26-31.

Discusses high voltage distribution within a restricted area effecting economics of installation. Tables.

4781* **Automatic Control of Portable Electric Power Stations.** (Russian.) N. K. Arkhangel'skii. *Energeticheskii Biulleten*, 1953, no. 10, Oct., p. 10-14.

Describes operation of stations in petroleum industry. Diagrams.

4782* **Electric Drive Installation of the 4E-UZTM Type for Well Drilling to a Depth of 5000 M.** (Russian.) B. G. Iakushkin. *Energeticheskii Biulleten*, 1953, no. 10, Oct., p. 26-32.

Discusses selection of power equipment for drilling operations. Graphs.

4783* **High Voltage Airblast Circuit-Breakers.** C. H. Flurscheim. *Engineering Journal*, v. 36, Dec. 1953, p. 1588-1595.

A review. Diagrams, graphs, photograph. 10 ref.

4784 **The Design of Equivalent Circuits for Electromagnetic Apparatus.** A. S. Rosenkrantz. *Engineers' Digest*. v. 14, Dec. 1953, p. 463-465. (Translated from *Elektritchestvo*, no. 5, 1953, p. 67-74.)

Principles which govern synthesis of equivalent circuits representing electrical a.c. apparatus containing magnetic as well as electrical circuits are presented. Diagrams.

4785 **Elimination of a Static Hazard by the Use of Radioactive Strontium 90.** G. G. Fowlie and B. Morris. *Industrial Chemist and Chemical Manufacturer*, v. 29, Dec. 1953, p. 585-591.

Describes method for use during handling of inflammable powders and solvents. Tables, graphs, diagrams. 13 ref.

4786 **Some Experiments on Postive Point-to-Plane Corona and Spark Breakdown of Compressed Gases.** Thomas R. Foord. *Institution of Electrical Engineers, Proceedings*, v. 100, pt. 2, no. 78, Dec. 1953, p. 585-590: disc., p. 590.

A test pressure vessel for investigation of electrical discharges in gases at pressures up to 1000 psi. is described. Diagrams, graphs. 17 ref.

4787 **Meter Prblems and Consumers' Load Characteristics. I. Some Problems Arising in the Economics of Metering.** L. B. S. Golds. **II. A Study of Domestic Consumers' Load Characteristics as Affecting Meter Economics.** P. Schiller. *Institution of Electrical Engineers, Proceedings*, v. 100, pt. 2, no. 78, Dec. 1953, p. 619-631; disc., p. 632-639.

Includes graphs, tables, diagrams. 11 ref.

4788* **Management of Electric Power in Metallurgy.** (Hungarian.) Béla Havas. *Kohászati Lapok*, v. 8, no. 12, Dec. 1953, p. 260-263.

Formulates and discusses basic principles for an economical management of electric power. Describes optimum exploitation of power plants, proper application of power, and continuous production. Tables.

4789* **Measurements of Phase Angles.** (English.) A. van Weel. *Philips Research Reports*, v. 8, Dec. 1953, p. 471-475.

Phase angles are measured from frequency variation of an oscillating circuit, caused by introducing the unknown phase angle into the closed loop of the oscillator circuit.

4790 **Nucleation in a Dielectric.** Vera Daniel and Clara Turner. *Philosophical Magazine*, v. 44, 7th ser., no. 359, Dec. 1953, p. 1371-1391.

Nucleation from solid solution is investigated by means of dielectric measurements. Diagram, graphs, tables. 11 ref.

4791* **Improve Power-Plant Instrumentation by Applying Human-Engineering Data.** J. G. Fleming. *Power*, v. 98, Jan. 1954, p. 86-89, 206, 208, 210.

Instruments must follow rules of optimum readability. Diagrams, charts.

4792 **Frequency Modulation of Microwaves.** Samuel Freedman. *Radio & Television News*, v. 51, Jan. 1954, p. 16-18.

Altering dimensions of frequency-controlling cavity in a microwave system will produce frequency modulation. Photographs, diagrams.

4793 **Circuit Interruption and Lightning Protection.** *Westinghouse Engineer*, v. 14, Jan. 1954, p. 8-11.

Lightning arresters, air circuit breakers, and over-current trip device are new developments. Photographs.

4794 **Drives and Control.** *Westinghouse Engineer*, v. 14, Jan. 1954, p. 22-27.

Advances made by Westinghouse in high-thrust motors, wind-tunnels, induction motors, magnetic-amplifier controls, and direct mounting gearmotors. Photographs.

4795* **Band-Pass Filters.** Fuad Surial Atiya. *Wireless Engineer*, v. 30, Dec. 1953, p. 307-311.

Reports that band-pass filters can be designed to have a maximally-flat or quasi-Tchebyshev response identical to corresponding band-pass amplifier. Diagrams, graphs. 5 ref.

Books and Miscellaneous Publications

4796 **Circuit Theory of Electron Devices.** E. Milton Boone. 483 p. 1953. John Wiley & Sons, Inc., New York. (TK7870 B64c)

Includes chapters on diodes, triodes, and equivalent circuits; tetrodes, pentodes, and equivalent circuits; audio-frequency voltage amplifiers; audio-amplifier power stage; gas-filled tubes as circuit elements; single-phase rectifiers and power supplies; polyphase rectifiers; tuned radio-frequency and band-pass amplifiers; radio-frequency power amplifiers; vacuum-tube oscillators; modulation and demodulation; and circuit theory of transistors.

4797 **Synchros. Self-Synchronous Devices and Electrical Servo-Mechanisms.** Leonard R. Crow. 222 p. 1953. Scientific Book Publishing Co., Vincennes, Ind. (TK2787 C88s)

Contributes a broad understanding of basic fundamental principles underlying functional operating theory as well as effective use and application of synchros and allied self-synchronous electrical mechanisms.

4798 **The Cathode Ray Oscillograph in Industry.** W. Wilson. 4th Ed. 273 p. 1953. Chapman & Hall Ltd., London. (TK381 W69c4)

Includes chapters on general principles and design; detailed description; accessory circuits; modern types of cathode ray oscillograph; single deflection readings; differential tests; applications requiring a repeating time base; tests requiring a single-sweep time base; tests involving independent bases other than time; the recording of mechanical pressures and strains; the electron microscope; and construction, operation and maintenance.

See also:
4429 (dielectric properties of glass)
4435 (electroconductivity of glass)
4496 (electrical uses of C in industry)
5132 (dynamical analogies)
5135 (Ferraris motors for controls)
5219 (electrical developments in steel mills)
5307 (machine for induction hardening of surfaces)
5440 (electrical equipment for wire drawing machines)
5712 (effects of carbon black on electrical properties of rubber)

ELECTROCHEMISTRY AND ELECTROPROCESSES

4799* **The Anodic Treatment of Strips and Wires.** (German.) E. Herrmann. *Aluminium*, v. 29, no. 12, Dec. 1953, p. 513-519.

Discusses uniform anodic treatment of strips, multiple-stage formation of Al-condenser strips, and composition of the electrolyte. Photographs, graphs, diagrams.

4800* **Potentiostat for Use in Electro-Chemical Experiments.** G. Schouten and J. G. F. Doornekamp. *Applied Scientific Research*, v. 3, sec. B, nos. 4-5, 1953, p. 265-278.

A sensitive and quick responding way of maintaining a constant potential on current carrying electrodes of an electrolytic bath. Diagrams, graphs. 6 ref.

Electrochemistry and Electroprocesses

4801* Galvanizing Embrittlement of Blackheart Malleable Iron. G. N. J. Gilbert. *British Cast Iron Research Association, Journal of Research and Development,* v. 5, Dec. 1953, p. 124-131 + 2 plates.

Discusses effects of P and Si on susceptibility to embrittlement. Quenching from 650 C prevents embrittlement. Micrographs, drawing, graphs, tables. 5 ref.

4802 The Silver-Silver Halide Electrodes. George J. Janz and Harry Taniguchi. *Chemical Reviews,* v. 53, Dec. 1953, p. 397-437.

Discusses preparation, stability, reproducibility, and standard potentials in aqueous and non-aqueous media. Diagrams, graphs, tables. 113 ref.

4803* Certain Problems of Electric Reduction of Persulfate. (Russian.) A. A. D'iakov. *Doklady Akademii Nauk SSSR,* v. 93, no. 4, Dec. 1, 1953, p. 685-687.

Investigations were made on kinetics of persulfate reduction in diluted solutions on cathodes from Cd, Pt, Cu, Al, and Mg. Polarization curves are given. Graphs. 10 ref.

4804* The Rate of Dissolution and the Passivation of Titanium in Acids with Ammonium Fluoride Added. M. E. Straumanis and C. B. Gill. *Electrochemical Society, Journal,* v. 101, Jan. 1954, p. 10-15.

Passivation of Ti by NH_4F is caused by decrease in number of active local cathodes (covered by the salt film) and by increase of overvoltage (polarization) on free cathodes. Tables, graphs, 13 ref.

4805* The Electrolytic Preparation of Molybdenum From Fused Salts. I. Electrolyite Studies. II. The Preparation of Reduced Molybdenum Halides. III. Studies of Electrode Potentials. Seymour Senderoff and Abner Brenner. *Electrochemical Society, Journal,* v. 101, Jan. 1954, 16-38.

Includes photographs, diagrams, tables, micrographs, graphs. 48 ref.

4806* Electrochemical and Electrometallurgical Industries of Canada. II. Quebec, The Maritime Provinces, and Newfoundland. A. C. Holm. *Electrochemical Society, Journal,* v. 101, Jan. 1954, p. 7C-16C.

Deals with electroproducts industries of Canada and their inseparable partners, the hydroelectric power developments. Photographs, table.

4807 Electrodepositors' Technical Society, Journal, (Annual Volume), v. 28, 1951-1952. 291 p. Institute of Metal Finishing, Incorporating Electrodepositors' Technical Society, London, W. C. 1. (TS670 E25j)

Includes 16 papers, individually abstracted.

4808 Inspection of Electroplated Aircraft Parts. P. Skeggs. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 15-26.

General inspectional requirements of D.T.D. specifications covering plating of aircraft parts are outlined. Sampling methods of testings are dealt with generally; particular requirements of certain specifications are dealt with in more detail. Surface treatment of Zn and Cd coatings is discussed. Graphs, diagrams.

4809 The Nature of the Film Present on Iron After Brightening in Marshall's Solution. A. Hickling, W. A. Marshall, and E. R. Buckle. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 47-60; disc., p. 61-68.

Investigation was undertaken with object of obtaining definite proof of existence of film and some indication of its nature, thickness, and mode of formation. Graphs, diagram. 4 ref.

4810 Finishes for Communications Equipment With Special Reference to Electroplate Coatings. E. C. J. Marsh. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 69-88 + 8 plates.

Treatment of the subject is very general, intentionally avoiding technical details as far as possible. Tables.

4811 An Experimental Study of Electropolishing. J. Edwards. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 133-148; disc., p. 149-154 + 2 plates.

Paper describes an experimental study of smoothing efficiencies in electropolishing. Work is part of a full investigation of mechanism of electropolishing which is to be published elsewhere. Graphs, diagrams. 8 ref.

4812 The Electrodeposition of Tin-Antimony Alloys From Chloride-Fluoride Electrolytes. J. W. Cuthberton and N. Parkinson. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 195-201.

Investigation has shown that alloys of Sn and Sb containing up to about 45% of Sb can be satisfactorily deposited from solutions containing chlorides of the two metals, a fluoride, and an addition agent. Graphs, tables. 5 ref.

4813 The Plating of Aluminium Articles as a Production Process. A. W. Wallbank. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 209-218; disc., p. 218-227.

Discusses Al as a basis metal; problems and methods of plating; and history of electrolytic (Vogt) process. Tables. 11 ref.

4814 An Electron-Diffraction Investigation of the Structure of Electrodeposited Coatings on Iron Single Crystals. D. J. Evans and M. R. Hopkins. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 229-238; disc., p. 245-251.

Results emphasize importance of the effect of composition of plating solution upon structure of the deposit, since with some solutions, only a polycrystalline deposit has been observed under a variety of plating conditions. Diagrams, graphs, table. 5 ref.

4815 The Crystal Structure of Electrodeposited Silver. D. N. Layton. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 239-244; disc., p. 245-251 + 1 plate.

Electron-diffraction examination showed this thin deposit to consist of small randomly disposed crystals. Diagrams, table. 17 ref.

4816 Anodised Aluminum Surfaces for Wear-Resistance. William Campbell. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 273-291 + 2 plates.

Records some experimental work in developing commercial production of hard oxide films on Al by anodizing, with particular reference to treatment of Al alloys of high alloy content. Diagrams, graphs, tables.

4817 Theory of Electrolytic Polishing. A Review. R. Pinner. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 444-450.

A review. Graphs, diagram. 29 ref.

4818 Finishes Alternative to Conventional Nickel-Chromium. J. Chadwick. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 451-455.

Corrosion resistance of various substitutes for normal Ni-Cr plating were investigated in marine, industrial, and indoor exposures over 2½ years. A high temperature Cr plating technique is described which gives corrosion resistance almost 3 times that of normal deposits. Graph, tables. 4 ref.

4819 A Simple Costing System for General Plating Shops. Fredk. C. Pond. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 457-458.

Describes records and procedures.

4820 Preparation of Copper and Copper-Base Alloys for Electroplating. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 459-460.

Summarizes ASTM Tentative Recommended Practice B281-53T.

4821 Semiautomatic Plating Pays Where Sizes, Shapes Vary. T. Stoddard. *Iron Age,* v. 173, Jan. 14, 1954, p. 122-124.

Semiautomatic plating offers economy, high production, and good quality in ships where parts vary in shape, size, and finish. Photographs, diagram.

4822 New Plating Process Deposits Nickel Brighter, Faster. C. G. Rising. *Iron Age,* v. 172, Dec. 24, 1953, p. 78-81.

Features built into process overcome shortcomings previously experienced and provide an easy-to-control bath. Operating ranges for temperature and current density are broad.

4823 The Production of Fine Wires by Electrolytic Polishing. H. R. Haines and B. W. Mott. *Journal of Scientific Instruments*, v. 30, Dec. 1953, p. 459-460.

Simple apparatus is described for reducing diameter of brittle or easily oxidized metal wires by an electrolytic polishing method. Diagram, table. 3 ref.

4824* Plating on Aluminum. Bernard E. Bunce. *Metal Finishing*, v. 52, Jan. 1954, p. 70-73, 76.

Describes phosphoric acid anodizing pretreatment. Table, diagram, photograph, micrograph.

4825* The Storage-Battery Industry. (German.) D. Evers. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 881-885.

Discusses design and uses of different types of storage batteries. Describes required quality of Pb used in storage batteries and salvaging of old batteries. Photographs.

4826* Some Individual Reactions on the Metal-Water Boundary Layer. (German.) Fritz Tödt. *Metalloberfläche*, Ausgabe A, v. 7, no. 12, Dec. 1953, p. 184-185.

Shows that minute parts of a monoatomic layer and true surface of the electrode can be measured by measuring amperage of generated galvanic current. The pH value of an aqueous solution can be determined directly at metal surface by determining effect of current density on potential. 3 ref.

4827* The Causes of Formation of Semispherical Bubbles When Copper-Plating Die-Cast Zinc in Hot Baths. (German.) W. Briese. *Metalloberfläche*, Ausgabe B, v. 5, no. 12, Dec. 1953, p. 188.

Experiments show that bubbles are caused by evaporation of residual solvent through the pores. Means of avoiding this defect are discussed.

4828 Report of the Committee on Battery Additives of the National Academy of Sciences. *National Research Council*, Oct. 30, 1953, 35 p.

4829* General Survey of the Electrochemical Behavior of Metals. II. (French.) Marcel Pourbaix. *Ossature metallique*, v. 18, no. 11, Nov. 1953, p. 581-590.

Discusses polarization curves and behavior of Fe in presence of aqueous solutions; in contact with a metal more noble than Fe; and in contact with a metal less noble than Fe. Diagrams, tables, graphs. 17 ref.

4830 A.E.S. Research Report Project No. 13. The Nature, Cause and Effect of the Porosity in Electrodeposits. I. The Porosity of Electrodeposits. Fielding Ogburn and Asaf Benderly. *Plating*, v. 41, Jan. 1954, p. 61-65.

Presents methods of studying porosity and corrodability of electrodeposits. Photograph, micrograph, diagrams, tables, graph. 3 ref. (To be continued.)

4831* Investigation of Cathode Processes During the Electrodeposition of Copper From Complex Electrolytes. (Russian.) E. A. Ukshe and A. I. Levin. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 9, Sept. 1953, p. 1396-1403.

Effects of current density and various additives were studied. Table, graphs. 18 ref.

4832* Nature of the Phenomenon of the "Hard Tearing Off" of Cathode Zinc. (Russian.) A. I. Levin, A. V. Pomosov, and T. A. Tkachenko. *Zhurnal Prikladnoi Khimii*, v. 26, no. 12, Dec. 1953, p. 1238-1244.

Discusses factors accompanying electrolysis process and their influence on properties of Al surface. Tables, diagram. 9 ref.

4833* Corrosion of Aluminum Refrigerator Condensers in Bath for the Electrodeposition of Zinc. (Russian.) A. I. Levin, A. V. Pomosov, and T. N. Rogatkina. *Zhurnal Prikladnoi Khimii*, v. 26, no. 12, Dec. 1953, p. 1245-1251.

Studies were made on conditions of electrochemical oxidation of Al to obtain protective films. Tables. 4 ref.

4834* Erosional Stability of Anodic Oxide Films on Aluminum Alloys. (Russian.) N. D. Tomashov, A. V. Shreider, and A. V. Bialobzheskii. *Zhurnal Prikladnoi Khimii*, v. 26, no. 12, Dec. 1953, p. 1252-1257.

Discusses influence of anodic oxidation on alteration of roughness of Al alloy surfaces. Diagrams, tables, graphs. 5 ref.

Books and Miscellaneous Publications

4835 Modern Electroplating. Sponsored by the Electrochemical Society, Inc. Allen G. Gray, editor. 563 p. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Consists of 28 papers, individually abstracted.

4836 General Principles. William Blum and Walter R. Meyer. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 1-46. 1953. John Wiley & Sons, Inc., New York (TS670 G78.8m)

Summarizes those principles and methods that may find application in plating of various metals. Photomicrographs, photographs, table. 115 ref.

4837 Methods of Control. Ralph A. Schaefer, Henry J. Sedusky, and Betty Luce. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 47-63. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Describes briefly some tests and their significance in specification plating. Tables, photograph. 21 ref.

4838 Alloy Plating. Charles L. Faust. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 64-97. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Indicates important role that alloy plating can assume. Outlines operating principles. Graphs, micrographs, photographs, diagram. 101 ref.

4839 Brass. Leonard E. Weeg and Harold J. Wiesner. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 98-115. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Covers principles; bath composition and functions of constituents; bath operation; preparation of basis metal; and maintenance and control. Tables. 49 ref.

4840 Cadmium. K. G. Soderberg and Leon R. Westbrook. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 116-134. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Almost every plating bath characteristic of consequence is in favor of cyanide Cd bath: its ability to give a dense, fine-grained deposit which may be made highly lustrous and reflective by use of brighteners that are stable in bath; high and easily balanced anode and cathode efficiencies; excellent covering power and good plate distribution on recessed articles.

4841 The Chromium Plating Process. George Dubpernell. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 135-177. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Outlines methods of obtaining thin coatings for decorative purposes and "hard" or industrial deposits. Includes tests and control measures. Tables, graphs, photographs. 199 ref.

4842 Properties of Chromium Plate. Cloyd A. Snavely and Charles L. Faust. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 177-187. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Chromium plate is unique among metal plates extensively used in commerce because of important bearing structure of the plate has upon its uses and performance. Actually, many variations in structure and physical properties can be obtained by proper adjustment of plating conditions and post-plating treatments. Theory underlying these structural characteristics is reasonably complete and is outlined in this paper. Micrographs, photographs, table. 24 ref.

4843 Cobalt. Henry B. Linford. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTRO-

Electrochemistry and Electroprocesses

CHEMICAL SOCIETY, INC. p. 188-193. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Discusses principles; functions of constituents of bath; operating conditions; maintenance and control; preparation of basis metals and finishing deposits; and tests of deposits. Tables. 23 ref.

4844 Rochelle Copper. A. Kenneth Graham and Harold J. Read. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 194-213. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Discusses rochelle copper; bath constituents; function of constituents of bath; operating conditions and characteristics of the rochelle-cyanide bath; maintenance and control; anodes; preparation of the basis metals; and test of deposits. Tables, graph. 47 ref.

4845 High Efficiency Cyanide Copper. R. R. Bair and D. A. Swalheim. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC., p. 213-225. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Includes discussion on functions of bath constituents; bath formulations; operating procedures; commercial plating; and testing of deposits. Diagrams. 13 ref.

4846 Pyrophosphate Copper. J. E. Stareck. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 225-231. 1953. John Wiley & Sons, Inc., New York (TS670 G78.8m)

Covers principles; bath composition; operating conditions; maintenance and control; anodes; preparation of basis metal; and tests of deposit. Tables. 21 ref.

4847 Acid Copper Electroplating and Electroforming. William H. Safranek and J. Homer Winkler. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 231-251. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Discusses history and development; principles; functions of bath constituents; operating conditions; physical properties and structure of deposits; maintenance and control; anodes; equipment; tests of deposits; preparation of basis metals; and mold and mandrels for electro-forming. Tables, photographs. 99 ref.

4848 Gold. Louis Weisberg and A. Kenneth Graham. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 252-266. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Resistance to tarnish, oxidation at elevated temperatures, and attack by most chemicals, combined with relative scarcity, high price, and pleasing appearance, have limited Au to specific uses. Processes and tests are described. Tables. 26 ref.

4849 Indium. Henry B. Linford. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 267-270. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Chief application of In plating is as a diffusion alloy in aircraft engine bearings. Tables. 19 ref.

4850 Iron. C. T. Thomas and V. A. Lamb. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 271-281. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Iron plating is one of the minor factors in plating world. Although present applications of Fe plating are limited, there is a continuing interest in electro-forming. Typical baths and controls are described. Tables, photographs. 30 ref.

4851 Lead. A. H. Du Rose and William Blum. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 282-298. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Appearance and properties of Pb limit its commercial use in electroplating largely to the field of corrosion protection. Tables, graph. 53 ref.

4852 Nickel. W. L. Pinner, K. G. Soderberg, and W. A. Wesley. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 299-355. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Covers use of Ni plating to protect metallic objects from corrosion, especially steel, brass, and Zn die castings and, to a smaller extent, Al and Mg alloys. Good appearance is usually important, and therefore non-tarnishing Cr is usually applied on top of the Ni. Less frequently, Au or brass with a lacquer finish is used as a final coating. Because of its mechanical properties, Ni plating is used to some extent to repair worn parts, and for electro-forming of printing plates, phonograph masters, sheets, tube, screen, and many other articles. Methods and controls are discussed. Graphs, diagrams, tables, photomicrographs. 172 ref.

4853 Platinum Group Metals. K. Schumpelt. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 356-366. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

The group of platinum metals comprises Pt, Ir, Os, Pd, Rh, Ru. Of these six metals only Pt, Pd, and Rh have found practical applications in the field of electroplating. Tables, graphs. 15 ref.

4854 Silver. N. E. Promisel. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 367-386. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Silver plating as discussed in this chapter has to do only with deposition of smooth, dense, adherent deposits on a metal or alloy basis metal and does not include electro-forming, electro-refining, etc. Tables. 29 ref.

4855 Stannate Tin. Fred Bauch and F. F. Oplinger. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 389-410. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Discussion consists of two separate parts. One dealing with conventional sodium stannate plus sodium hydroxide system. The other dealing with potassium stannate plus potassium hydroxide system. Graphs. 38 ref.

4856 Acid Tin. Paul R. Pine and A. H. DuRose. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 410-428. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Discusses principles; sulfate and fluoborate solutions; and tests of deposits. Photographs, tables. 67 ref.

4857 Tin Alloys. Frederick A. Lowenheim. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 434-442. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Discusses Sn-Cu or speculum; Sn-Ni; and Sn-Zn alloy plating processes. Tables. 30 ref.

4858 Acid Zinc. Ernest H. Lyons, Jr. and Hamnett P. Munger. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 444-459. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Discusses development of electro-galvanizing; sulfate- and chloride-type acid baths; zinc-ammonia bath; sulfate electroplating baths for strip and wire; zinc anodes; analytical methods; preparation of basis metals; and tests of deposits. Tables. 42 ref.

4859 Cyanide Zinc. R. R. Bair and L. J. Schustik. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC., p. 460-482. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

The matte Zn deposits is generally used where rust protection or ductility is of prime importance, whereas bright plating baths find application on articles requiring both corrosion protection and eye appeal. Graphs, tables. 30 ref.

4860 Uncommon Metals. Frederick A. Lowenheim. Paper from MODERN ELECTROPLATING. SPONSORED BY THE

ELECTROCHEMICAL SOCIETY, INC. p. 483-510. 1953. John Wiley & Sons, Inc. New York. (TS670 G78.8m)

Presents a review of work which has been published concerning many metals which are not being, or cannot be, practically electro-deposited at present. 314 ref.

4861 Aluminum Alloys. Fred Keller. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 511-524. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Of the different methods available, the Zn immersion method is now considered the most satisfactory and practical method for plating virtually all the different Al alloys with various other metals. Tables, diagrams, graph. 8 ref.

4862 Magnesium Alloys. H. K. DeLong. Paper from MODERN ELECTROPLATING. SPONSORED BY THE ELECTROCHEMICAL SOCIETY, INC. p. 524-535. 1953. John Wiley & Sons, Inc., New York. (TS670 G78.8m)

Covers cleaning and conditioning of Mg surfaces; the Zn coating process; plating procedures; and characteristics of plated finishes on Mg. Photographs, tables. 6 ref.

See also:
4571 (analysis of plating baths)
5249 (adhesion between smoothed and electro-deposited Ni)
5324 (electrochemical cleaning of tool steel)

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4863 Electronic Sound Absorber. Harry F. Olson and Everett G. May. *Acoustical Society of America, Journal*, v. 25, No. 1953, p. 1130-1136.

A transducing system that will reduce sound level in contrast to direct conversion from acoustical to heat energy. Diagrams, graphs, photograph.

4864 The Measurement of Noise With the Sound Spectrograph. Gordon E. Peterson and Gordon Raisbeck. *Acoustical Society of America, Journal*, v. 25, Nov. 1953, p. 1157-1162.

Sound spectrograph principle as employed in quantitative measurement of noise is presented. Photographs, graphs, diagrams. 3 ref.

4865 Transistor Physics. W. Shockley. *American Scientist*, v. 42, Jan. 1954, p. 41-72.

Discusses theory and basic underlying physical phenomena of transistor physics and electronics. Diagrams, tables, photographs. 14 ref.

4866 Magnetic Transfer of Stainless Steel Recording Wire. Samuel Storchheim. *Audio Engineering*, v. 37, Dec. 1953, p. 19-20.

Report of tests made to determine working conditions of various wires. Graphs, table.

4867* A New Transformerless Amplifier Circuit. Kerim Onder. *Audio Engineering Society, Journal*, v. 1, Oct. 1953, p. 282-286.

Describes transformerless amplifier using four tubes connected in a bridge circuit and so driven that each tube delivers equal power to a common load. Diagrams, graphs, photographs. 6 ref.

4868* A New Business Office Dictating Machine Using Magnetic Tape as Recording Medium. Samuel J. Hyman. *Audio Engineering Society, Journal*, v. 1, Oct. 1953, p. 317-320.

Includes photographs, diagrams.

4869* The L3 Coaxial Carrier System. R. H. Klie. *Bell Laboratories Record*, v. 32, Jan. 1954, p. 1-4.

New L3 system has made it possible to transmit more than 1,800 simultaneous messages over a pair of coaxial conductors. Photographs, diagram.

4870* "Nerve-Type" Transmission Line. R. L. Taylor and H. M. Straube. *Bell Laboratories Record*, v. 32, Jan. 1954, p. 21-24.

Nerve transmission is fundamentally an electrochemical phenomenon involving movement of relatively massive ions as well as electrons. Photographs, diagrams, graphs.

4871* Static Electrification. A Symposium Held by the Institute of Physics in London on 25, 26, and 27 Mar. 1953. *British Journal of Applied Physics*. 1953. Supplement no. 2. 104 p.

Consists of "Theory of Contact Electrification", F. A. Vick; "Survey of Generation and Dissipation of Static Electricity", P. S. H. Henry; "The Electrification of Fluids in Motion", W. Fordham Cooper; "Electrification by Freezing", E. W. B. Gill; "Liquids Giving No Electrification by Bubbling", W. R. Harper; "The Dissipation of Electrical Charges Generated by Rollers", J. A. Medley; "The Electrostatic Charging of Some Polymers by Mercury", J. A. Medley; "The Role of Asymmetric Rubbing in the Generation of Static Electricity", P. S. H. Henry; "Methods of Increasing the Electrical Conductivity of Surfaces", J. S. Forrest; "The Physics of Electrostatic Precipitation", H. J. Lowe and D. H. Lucas; "Two Electrostatic Field-Meters", A. S. Cross; "Electrostatic Coating Processes", R. Tilney and Henry W. Peabody; "The Measurement of Oxidation of Coal by Static Electrification", D. G. A. Thomas; "Survey of Electrostatic Generators", E. S. Shire; "Note on the Voltage Stabilization of an Electrostatic Generator", D. R. Chick and E. K. Inall; "Ten Years of Research on Electrostatics at the University of Grenoble 1942-1952", N. J. Felici; "Survey of Harmful Static Electrification", H. W. Swann; "The Practice Estimation of Electrostatic Hazards", W. Fordham Cooper; Henry; "Static Electricity on Rubber-Tyred Vehicles", D. Bulgin; "Factors in the Design of an Operating Theatre Free From Electrostatic Risks", D. Bulgin; "Safety Measures in Operating Theatres and the Use of a Radioactive Thallium Source to Dissipate Static Electricity", A. Quinton; "The Electrostatic Ignitibility and Electrification of Finely Powdered Hexamine", A. G. Peace; and "The Ignition of Explosives by Condenser Discharge—Effect of Added Circuit Resistance", G. Morris.

4872 Radiation From a Ground Antenna. James R. Wait. *Canadian Journal of Technology*, v. 32, Jan. 1954, p. 1-9.

It is shown that a horizontal electric dipole can radiate vertically polarized waves along the surface of a finitely conducting ground. Result is employed to calculate fields of a horizontal antenna of finite length. Diagrams, graph. 11 ref.

4873* Radio Frequency Communications at Coal Mines. P. N. Wyke and R. Gill. *Colliery Guardian*, v. 187, Dec. 1953, p. 791-797.

Abstract of paper read before North Staffordshire Institute of Mining Engineers at Stoke-on-Trent, Nov. 1953. Results of tests made with portable equipment at collierys above and below ground. Photographs, diagrams.

4874* Power Transistors for Audio Output Circuits. L. J. Giacoletto. *Electronics*, v. 27, Jan. 1954, p. 144-148.

Dependence of transistor characteristics on temperature is considered in this method for analysis of power transistors for audio output circuits. Photograph, diagrams, graphs, table. 10 ref.

4875* Experimental Determination of the Properties of Microstrip Components. Maurice Arditi. *Electrical Communication*, v. 30, Dec. 1953, p. 283-293.

Equipment designed to make full use of microstrip and conventional printed-circuits. Considerable saving can be achieved. Diagrams, graphs, photographs.

4876* Coaxial-to-Helix Transducers for Traveling-Wave Tubes. R. E. White. *Electrical Communication*, v. 30, Dec. 1953, p. 300-304.

Design data and procedures for transition sections have been worked out. Transducers giving good matches over two-to-one frequency ranges have been constructed. Diagrams, graphs.

4877 Valve Reliability in Digital Calculating Machines. L. Knight. *Electronic Engineering*, v. 26, Jan. 1954, p. 9-13.

Measures to reduce tube failures and to minimize inconvenience of unprevented failures are discussed. Graphs. 11 ref.

4878 D.C. Amplifiers. I. Methods of Amplifying and Measuring Small Direct Currents and Potentials. J. Yarwood and D. H. LeCroissette. *Electronic Engineering*, v. 26, Jan. 1954, p. 14-19.

Amplification of direct currents of less than 10^{-6} amp. (1 μ amp.)

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can be accomplished with this low cost instrument. Tables, photographs, diagrams. 22 ref. (To be continued.)

4879 Some Recent Developments in Electronic Engineering. *Electronic Engineering*, v. 26, Jan. 1954, p. 20-26.

A survey of recent developments is presented. Photographs, diagram.

4880 Transistors: Theory and Application. XI. Cascading Transistor Amplifier Stages. Abraham Coblenz and Harry L. Owens. *Electronics*, v. 27, Jan. 1954, p. 158-161.

Circuit equations for practical configurations of transistor amplifiers are presented. Values are given to guide designer. Diagrams, table.

4881 Phantastron Computes Pulse-Width Ratios. L. D. Findley. *Electronics*, v. 27, Jan. 1954, p. 164-167.

Phantastron divider computes width ratio of two pulses occurring simultaneously in separate channels. Also used to measure phase shift or delay. Diagrams.

4882 Transistors in Telemetry. Fred M. Riddle. *Electronics*, v. 27, Jan. 1954, p. 178-180.

Examination of an F.M. telemetering system shows that transistors can be used as information oscillators. Photographs, diagrams, graphs.

4883 Some Aspects of Transductor Design, With Particular Reference to Discharge-Lamp Circuits. C. E. Williams. *Institution of Electrical Engineers, Proceedings*, v. 100, pt. 2, no. 78, Dec. 1953, p. 667-673.

Includes diagrams, graphs. 20 ref.

4884 Microwave Diffraction Measurements in a Parallel-Plate Region. Ronald V. Row. *Journal of Applied Physics*, v. 24, Dec. 1953, p. 1448-1452.

Describes apparatus. Presents comparison of theory and experimental results. Photograph, diagrams, graphs. 11 ref.

4885 Approximate Solutions of the Space-Charge Problem for Some Unusual Electrode Geometries. Henry F. Ivey. *Journal of Applied Physics*, v. 24, Dec. 1953, p. 1466-1472.

Includes tables, graphs. 17 ref.

4886* Semiconduction Properties of Zinc Phosphide (P_2Zn_3). (French.) J. Lagrenaudie. *Journal de chimie physique*, v. 50, no. 10, Oct. 1953, p. 545-547.

Discusses photoconductivity, infrared transparency, thermal measurements, and rectifying effects. Graphs. 8 ref.

4887* The Design of Delay Multivibrator Type Time Modulator. Y. D. Altekar. *Journal of Scientific & Industrial Research*, v. 12, sec. B, Nov. 1953, p. 507-514.

Measurements with experimental designs are found to agree with theory within limits of tolerance for components in the circuit. Diagram, table.

4888 Rectification by Semiconductors in a Thermal Field. I. M. Tsidil'kovsky. *National Science Foundation Translation*, no. 85, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 91, no. 1, July 1953, p. 63-66.)

Results show that rectification coefficient increase is greater when dissociation energy is larger and additive concentration and hole mobility is smaller. Graphs. 6 ref.

4889* Transit Time Phenomenon of Diodes in the Range of Incipient Current Flow. (German.) F. W. Gundlach. *Philips Research Reports*, v. 8, Dec. 1953, p. 419-426.

Discusses calculation of convection currents at anode when tubes is in exponential region of characteristic. 11 ref.

4890 On Conduction in Impurity Bands. Walter Baltensperger. *Philosophical Magazine*, v. 44, 7th ser., no. 359, Dec. 1953, p. 1355-1363.

Includes graphs, table. 20 ref.

4891 Effect of Traps on Carrier Injection in Semiconductors. H. Y. Fan. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1424-1428.

Considers photoconductivity and spread of excess carrier concentration under applied field. Graph. 5 ref.

4892 Measurement of Noise Spectra of a Point Contact Germanium Rectifier. F. J. Hyde. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1017-1024.

Uniform component is equal to shot noise for small currents. Graphs, table. 8 ref.

4893* 82-Channel Cascode Tuner. E. D. Lucas, Jr. *Radio-Electronics*, v. 25, Jan. 1954, p. 43-45.

Describes construction and operation. Diagram, photographs.

4894* Video Amplifier Problems. Wallace Waner. *Radio-Electronics*, v. 25, Jan. 1954, p. 53-55.

Includes diagrams, photographs.

4895* Basic Color TV. I. Some of the Fundamental Principles of Color and Vision. D. Newman and J. J. Roche. *Radio-Electronics*, v. 25, Jan. 1954, p. 58-60.

Includes diagrams. (To be continued.)

4896* Most Useful Schematics of 1953. *Radio-Electronics*, v. 25, Jan. 1954, p. 81-92.

Presents circuit diagrams of some commercial TV receivers.

4897 Electrolytic Capacitors. Emery Deutsch. *Radio-Electronics*, v. 25, Feb. 1954, p. 69-70.

A comparison of Ta anode foils to Al is presented. Photographs, graphs.

4898 Electropilot. Fred Shunaman. *Radio-Electronics*, v. 25, Feb. 1954, p. 96, 98-100.

Electronic guide for planes with the skill of a human pilot, but without his weaknesses is described. Diagrams, photographs.

4899 Phone-Plug Amplifier. H. F. Starke and C. W. Martel. *Radio & Television News*, v. 51, Jan. 1954, p. 65, 80.

Details on a compact transistor amplifier which will give a gain of approximately 20 decibels at 1000 ohms output impedance. Photographs, diagram.

4900 A Capacitive-Tuned Ultra-High-Frequency Television Tuner. E. M. Hinsdale, Jr. and Irwin D. Baumel. *RCA Review*, v. 14, Dec. 1953, p. 461-481.

Includes illustrations, graphs, photographs, tables. 4 ref.

4901 Development of a New Premium Twin Triode. H. E. Stumman and J. W. Ritcey. *RCA Review*, v. 14, Dec. 1953, p. 482-491.

Construction and characteristics of the new version of the 6J6. Illustrations, graphs, tables.

4902 Viewing Storage Tube With Halftone Display. M. Knoll, P. Rudnick, and H. Hook. *RCA Review*, v. 14, Dec. 1953, p. 492-501.

Description of transmission control type cathode-ray storage tube. Illustrations, photographs. 10 ref.

4903 Filter-Helix Traveling-Wave Tube. I. The Filter Helix, A New Circuit Element for Traveling-Wave Amplifiers and Oscillators. W. J. Dodds and R. W. Peter. *RCA Review*, v. 14, Dec. 1953, p. 502-532.

Includes illustrations, photographs, graphs, tables. 12 ref.

4904 Radiation Pattern Synthesis. Edmund A. Laport. *RCA Review*, v. 14, Dec. 1953, p. 533-545.

Includes diagrams, graphs, table. 4 ref.

4905 Particle Counting by Television Techniques. L. E. Flory and W. S. Pike. *RCA Review*, v. 14, Dec. 1953, p. 546-556.

Experimental counting of red blood cells by television. Diagrams, graph, photographs, micrograph.

4906 The Tangier Radio Relay System. Carl G. Dietsch. *RCA Review*, v. 14, Dec. 1953, p. 557-568.

Examines reasons for Tangier as relay station. Describes necessary equipment. Maps, photographs, diagram. 6 ref.

4907 A P-N-P Triode Alloy Junction Transistor for Radio-Frequency Amplification. C. W. Mueller and J. I. Pankove. *RCA Review*, v. 14, Dec. 1953, p. 586-598.

Includes diagrams, tables, graphs. 5 ref.

4908 High-Frequency Scatter Sounding Experiments at the National Bureau of Standards. Richard Silberstein. *Science*, v. 118, Dec. 25, 1953, p. 759-763.

Discusses intensity vs. range photographs and range-time records at fixed frequencies. Describes plan position indicator representation and sweep-frequency backscatter records. Photographs. 13 ref.

4909 Computers in Business. Lawrence P. Lessing. *Scientific American*, v. 190, Jan. 1954, p. 21-25.

Electronic machines are now being applied to automatic handling of entire office procedures. Photographs.

4910 Industrial Applications of Electronic Equipment in the Automotive Industry. Albert J. Forman. *Tele-Tech*, v. 13, Jan. 1954, p. 62-77

A review. Tables, diagrams, photographs.

4911 Computer Circuits for High Temperatures. John F. Koch, Jr. and George C. Hand, Jr. *Tele-Tech*, v. 13, Jan. 1954, p. 82-84, 131-137.

Carefully selected components provide reliable operation of digital computer at 200 C. Diagrams, graphs, photographs.

4912 Recording TV on Magnetic Tape. Bernard F. Osbahr. *Tele-Tech*, v. 13, Jan. 1954, p. 81, 124-125.

Demonstrations prove practicability of recording video in both black-and-white as well as in color. Photographs, diagrams.

4913 Philco Develops "Surface-Barrier" Transistor. *Tele-Tech*, v. 13, Jan. 1954, p. 87, 112-115.

Describes construction, operation, and applications. Photographs, diagram.

4914* Electronic A.C. Potentiometer. L. Tasny-Tschiassny. *Wireless Engineer*, v. 30, Dec. 1953, p. 295-298.

Describes equipment and operating characteristics. Diagrams. 13 ref.

4915* Noise Factor of Conventional V.H.F. Amplifiers. N. Houlding. *Wireless Engineer*, v. 30, Dec. 1953, p. 299-306.

A discussion of experimental studies and results. Diagrams, tables, graphs. 5 ref.

4916* Electron Multiplier Valve. A. Lempicki. *Wireless Engineer*, v. 30, Dec. 1953, p. 312-317.

Detailed comparison of performance of an electron multiplier with that of a conventional tube is given. Diagrams, graph. 5 ref.

Books and Miscellaneous Publications

4917 Modulation Theory. Harold S. Black. 363 p. 1953. D. Van Nostrand, New York. (TK6553 B56m)

Discusses fundamentals of modulation theory in light of recent progress in this and related fields. It is addressed to advanced students and practicing engineers.

4918 Photo-Electric Multipliers. S. Rodda. 180 p. 1953. MacDonald & Co. Ltd., London. (QC715 R61p)

Gives an account of development and field of use of photo-electric multiplier tubes, which in consequence of advances made in the last few years have become important in many scientific and technical applications.

4919 Television Receiver Design. I.F. Stages. A. G. W. Uitjens. v. VIIIA of Electronic Valves. 177 p. 1953. N. V. Philips' Gloeilampenfabrieken, Eindhoven. (TK6565 P54etr)

Contains chapters on gain and bandwidth with two-terminal coupling networks; response curve of the complete amplifier; distortion; gain, bandwidth, and distortion with four-terminal coupling networks; noise; feedback; and practical considerations following on the theory.

See also:
4419 (seals for waveguides)
4810 (finishes for communications equipment)
5034 (microwave radiometers)
5089 (electronic milli watt meter)
5094 (electronic tachometer)
5130 (automatic control systems)
5131 (voltage-reference circuits)
5169 (discussion on semiconductors)

ENGINEERING ECONOMICS

4920* Total Mining Investment Doubled in Last Ten Years. R. L. Edsall. *Canadian Mining Journal*, v. 74, Dec. 1953, p. 51-55.

Presents analysis of Canadian capital investment structures and rates of growth in mineral industries. Tables, charts.

4921* Nickel—An Expanding Canadian Industry. W. R. McClelland. *Canadian Mining Journal*, v. 74, Dec. 1953, p. 60-63.

Brief survey of resources and development indicate that Canada will continue to dominate world supply pattern in future years. Tables, graphs, photographs.

4922 Canadian Chemcial Industry Grows. *Chemical Age*, v. 69, Dec. 19, 1953, p. 1279-1280.

Prospects for continuous development analyzed.

4923 Syndet Sales Pass Soap. Foster Dee Snell. *Chemical and Engineering News*, v. 32, Jan. 4, 1954, p. 36-37.

Synthetic detergent production and sales on rapid incline. Graph.

4924 The European Chemical Industry: Denmark. *Chemical and Engineering News*, v. 32, Jan. 11, 1954, p. 152-156, 158.

Chemical industry in a country with negligible resources is discussed. Tables, photographs.

4925* Industry's Steady Climb Continued in '53; Strong Gains in '54 Predicted. Earl H. Eacker. *Gas*, v. 30, Jan. 1954, p. 36-39.

Review of past year and future goals of gas industry. Graphs.

4926* Marketed Production of Natural Gas Increased 7 Per Cent Last Year. *Gas Age*, v. 112, Dec. 17, 1953, p. 43-44, 78.

Production, distribution, imports, and exports are discussed. Tables.

4927* Amenities as a Factor in Regional Growth. Edward L. Ullman. *Geographical Review*, v. 44, Jan. 1954, p. 119-132.

Pleasant living conditions instead of more narrowly defined economic advantages are becoming sparks that generate significant population increase. 41 ref.

4928 Production Processes. *Iron Age*, v. 173, Jan. 7, 1954, p. 314-342.

Outstanding developments in metal working processes during 1953 and significant production trends for 1954. Photographs, graphs, diagram. 55 ref.

4929 Price and Production Data. *Iron Age*, v. 173, Jan. 7, 1954, p. 405-420.

Includes steel industry, non-ferrous, pig iron, ore, ferroalloys, and iron and steel scrap. Tables.

4930* Cost Reduction Program That Saved $3,800,000 in 1953. E. E. Hartzler. *Machinery*, v. 60, Jan. 1954, p. 181-183.

Study from the Factory Methods and Work Standards Department of the Consolidated Vultee Aircraft Corporation. Photographs.

4931 The Coal Industry in Northern Wyoming and the State of Montana. Walter J. Johnson. *Mining Engineering*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 196, Dec. 1953, p. 1262-1271.

Coals in northern Wyoming and Montana are free-burning and

Engineering Economics

non-caking. They range from lignite to bituminous C in rank. Strip and underground mining are employed to supply railroad, utility, industrial, and domestic fuel. Graphs, tables, maps, diagrams. 8 ref.

4932 Over Half of World's Reserves Now Concentrated in Middle East. Dahl M. Duff. *Oil and Gas Journal*, v. 52, Dec. 21, 1953, p. 117-119, 250.

Presents an analysis of world's petroleum production. Diagrams, table.

4933 World-Wide Oil Report. Middle East and Eastern Mediterranean. Africa. Europe. Southern and Eastern Asia. South America and Trinidad. North America. Other Refineries. *Oil and Gas Journal*, v. 52, Dec. 21, 1953, p. 121-168, 170, 173-174.

Includes tables, maps.

4934 Demand Will Increase, But at Slower Pace. *Oil and Gas Journal*, v. 52, Dec. 21, 1953, p. 176-177, 179-180.

Presents discussion of world demand for and production of petroleum. Photographs, tables.

4935 Oil Policy Improves in Free World Nations. C. F. Dohm. *Oil and Gas Journal*, v. 52, Dec. 21, 1953, p. 194, 196, 198-199, 202 .

Discusses factors attracting investment capital. Photographs.

4936 West German Production up 25 Per Cent. A. M. Stahmer. *Oil and Gas Journal*, v. 52, Dec. 21, 1953, p. 235-236, 238-239.

Reports underground reserves estimated at 360 million barrels. Photographs, map.

4937 What's the Picture in Eurpoe Today- Cornelius J. Dwyer. *Oil and Gas Journal*, v. 52, Dec. 21, 1953, p. 242, 244, 247.

Reports there are signs that petroleum product price structure is weakening. Graph, photograph.

4938* Problems of World Economy in Eastern Europe. (German.) *Osteuropa*, v. 3, no. 6, Dec. 1953, p. 417-421.

Applies fundamental principles to present economic situation of Eastern Europe. Discusses shift of foreign trade away from the West, toward Soviet Union and other Iron Curtain Countries.

4939 1954 Metalworking Facts and Figures. *Steel*, v. 134, Jan. 4, 1954, p. 157-204.

Statistics are given on production of goods, labor, prices, earnings, etc. Tables, graphs.

4940* Planning and Calculation of Basic Cost Accounting Indices of a Tool Shop. (Russian.) A. M. Mikhailov and A. I. Faerman. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 93-95.

Discusses simplification and acceleration of accounting procedures.

4941* The Foreign Trade of England in 1953 and the Soviet-British Trade Relations. (Russian.) V. Mordvinov. *Vneshniaia Torgovlia*, v. 23, no. 12, Dec. 1953, p. 20-25.

Suggests increased British-Soviet trade. Lists materials the Soviet Union will supply.

4942* World Agricultural Production in 1952-53. *World Crops*, v. 6, Jan. 1954, p. 5-9.

Presents summary of principal features of situation during 1952-53. Predicts outlook for immediate future. Photographs, graph.

Books and Miscellaneous Publications

4943 Money Magic in Stocks. Walter K. Gutman. 279 p. 1953. Investors Advisory Institute, Inc., New York. (HG4841 G98m)

Presents data obtained from statistical services, company reports, and other sources believed reliable.

See also:
4788 (management of electric power)
4819 (plating shop costing system)
5078 (savings in diesel fuel)
5222 (economics of converter steel works)
5733 (air conditioning costs)
5737 (air conditioning costs)
5829 (use of plywood pipes in cellulose-paper industry)

FLUID MECHANICS

4944* Stationary Waves in Water Flowing Over a Rough Surface. Chia-Shun Yih. *American Geophysical Union, Transactions*, v. 34, Dec. 1953, p. 889-892.

Stationary waves at the surface of a stream due to a two-dimensional roughness of small amplitude at the bottom are investigated. 2 ref.

4945 Sensor Controls Airflow, Liquid Level. George L. Christian. *Aviation Week*, v. 59, Dec. 21, 1953, p. 50, 52-54, 57.

Discusses design and operating characteristics of new control unit. Photographs, diagrams, graphs.

4946* Two-Dimensional Potential Flows With a Free Boundary. Fritz John. *Communications on Pure and Applied Mathematics*, v. 6, Nov. 1953, p. 497-503.

Describes a method for obtaining two-dimensional flows of an imcompressible, irrotational liquid with a free surface. Graph, diagram.

4947* An Integral Relation and Its Application to Solution of Pressureless Filtration Problems. (Russian.) I. A. Charnyi. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 251-254.

Formula for water delivery was applied to three examples. Graphs. 5 ref.

4948* Statistical Theory of Suspended Layer Formation. (Russian.) N. I. Syromiatnikov. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 421-424.

Irregular movement of particles in a suspended layer under influence of hydrodynamic forces of flow and forces of the gravitational field are similar to thermal movement of gas molecules. Graphs. 2 ref.

4949* Equations of Motion of a Turbulent Flow on the Bend of a Water Conductor. (Russian.) A. K. Ananian. *Doklady Akademii Nauk SSSR*, v. 93, no. 4, Dec. 1, 1953, p. 633-636.

Velocity and other dynamic parameters may be calculated if field of longitudinal velocities on a rectilinear region is given. 4 ref.

4950 Fluid Dynamics. Murray Weintraub. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 112-117.

Reports developments directly applicable to design and operation rather than to any outstanding basic discoveries. Discusses investigations of non-Newtonian flow, solids transport, and fluidization. Photograph. 206 ref.

4951* Solution of Hydrodynamic Problems on the Movement of Non-Newtonian Liquids. (Russian.) I. I. Rogachev. *Kolloidnyi Zhurnal*, v. 15, no. 5, Sept.-Oct. 1953, p. 384-390.

Describes one possible approximation. Graphs, tables. 8 ref.

4952 Concerning Exact Solutions of a Class of Hyperbolic Equations Applicable in the Theory of the Water Hammer. D. M. Volkov. *National Science Foundation Translation*, no. 46, July 1953, 2 p. (Original in *Doklady Akademii Nauk SSSR*, v. 90, 1953, p. 49.)

Equations of water hammer in pipes of varying cross section and wall thickness have form of a hyperbolic system. 3 ref.

4953 Absorption of Ultrasonic Waves in Certain Viscous Liquids. I. G. Mikhailov. *National Science Foundation Translation*, no. 59, July 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 991-993.)

Tests were run on specially refined vegetable oils. Measurements were made by liquid prism method. Table. 9 ref.

4954 Interaction of Ultrasonic Waves in Liquids. G. D. Mikhailov. *National Science Foundation Translation*, no. 70, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 663-664.)

Experiments were conducted with different liquids in normal conditions. Diagram, oscilliogram, graph, table.

4955* Liquid Level Measurement and Control. Arthur L. Landesman. *Paper Trade Journal*, v. 138, Jan. 8, 1954, p. 18, 22, 24.

Discussion of air bubbler tube of hydrostatic pressure method and float type instruments. Diagrams.

4956 Venturi Tube vs. Orifice Plate. Dan T. McDonald. *Petroleum Processing*, v. 9, Jan. 1954, p. 66-71.

Describes measurement of flow of gas in large volumes or at low pressures. Photographs, graph, table. 4 ref.

4957 Experiments on Magneto-Hydrodynamic Channel Flow. W. Murgatroyd. *Philosophical Magazine*, v. 44, 7th ser., no. 359, Dec. 1953, p. 1348-1354.

Discusses equipment, procedure, and results. Diagram, graphs, table. 4 ref.

4958 On the Mechanism of Choked Jet Noise. A. Powell. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1039-1056.

Criterion for the self-maintained cycle is given, enabling certain qualitative deductions concerning the intensity to be made. Diagrams, graphs. 6 ref.

4959* Stability of Plane Flows of a Viscous Liquid Between Two Walls. (Russian.) V. A. Borodin and Iu. F. Ditiakin. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 569-578.

Galerkin's method was used to analyze flows with velocity profiles having an inflexion point. Graphs, tables. 5 ref.

4960* Horizontal Hydrodynamic Impact of a Sphere in Presence of a Free Surface of the Liquid. (Russian.) E. L. Blokh. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 579-592.

Considers case when a sphere is half immersed in an incompressible liquid and a spherical shell half filled with liquid. Diagrams, graphs. 7 ref.

4961* Construction of Double-Row Grids by Method of Velocity Hydrograph. (Russian.) G. Iu. Stepanov. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 593-598.

Simonov's method was used to give expressions for complex potential of desired flow as an analytic function of complex velocity. Diagrams. 3 ref .

4962* Jet Flow Around a Contour Executing Small Oscillations. (Russian.) M. I. Gurevich and M. D. Khaskind. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 599-603.

Considers plane problems of small oscillations. 4 ref.

4963* The Propagation of Shock Waves in a Channel of Non-Uniform Width. W. Chester. *Quarterly Journal of Mechanics and Applied Mathematics*, v. 6, Dec. 1953, p. 440-452.

Disturbance produced behind a plane shock wave of arbitrary strength is investigated. Graphs, diagram. 4 ref.

4963a Spherically Symmetric Solutions of the Equations of Gas Dynamics. G. C. McVittie. *Royal Society, Proceedings*, v. 220, ser. A, Dec. 8, 1953, p. 339-355.

Method adapted to case of spherically symmetric gas motions. 5 ref.

FOOD TECHNOLOGY

4964* Metal Inactivation in Edible Oils by Carboxymethylmercapto Succinic Acid. C. D. Evans, A. W. Schwab, and Patricia M. Cooney. *American Oil Chemists' Society, Journal*, v. 31, Jan. 1954, p. 9-12.

Presents results of experimental studies. Tables. 16 ref.

4965* Synthetic Aromatics for Food. L. Benezet. *American Perfumer and Essential Oil Review*, v. 62, Dec. 1953, p. 429-432.

Presents components and empirical formulas for synthetic flavors of apple, grape, almond, hazelnut, walnut, prune, apricot, and pear. Photograph, tables.

4966* Moisture Determination of Foods by Hydrogen Nuclei Magnetic Resonance. T. M. Shaw, R. H. Elsken, and C. H. Kunsman. *Association of Official Agricultural Chemists, Journal*, v. 36, Nov. 1953, p. 1070-1076.

Includes graphs. 5 ref.

4967 Continuous Honey Processing. G. F. Townsend and M. G. Barrington. *Canadian Chemical Processing*, v. 37, Dec. 1953, p. 24, 26, 28.

Describes how honey can be continuously pasteurized; filtered and stabilized for liquid pack; or processed for fine granulation in the same equipment. Diagram, photographs. 5 ref.

4968 Better Health in Balanced Diets. Charles Glen King. *Chemical and Engineering News*, v. 32, Jan. 4, 1954, p. 20-22.

Importance of trace mineral elements as essential catalysts in controlling plant and animal metabolism. Diagram, photograph.

4969 Flavour Assessment: A Biometrician's Viewpoint. J. O. Irwin. *Chemistry & Industry*, 1953, no. 51, Dec. 19, p. 1348-1352.

Discusses difficulties and requirements for suitable tests and standards. Tables. 8 ref.

4970* Recent Advances in Milk Processing Plant. J. E. F. Renton. *Chemical & Process Engineering*, v. 34, Dec. 1953, p. 377-380, 383.

Discusses advances in heating, evaporating, and drying plant for milk producers. Photographs, diagram, micrograph.

4971 Recent Developments in the Study of Oxidation Deterioration of Lipids. C. H. Lea. *Chemistry & Industry*, 1953, no. 49, Dec. 5, p. 1303-1309.

A review. Diagrams, tables, graphs. 60 ref.

4972* High Frequency Looms As Improved Cooking Method. Lloyd E. Slater. *Food Engineering*, v. 26, Jan. 1954, p. 52-53, 148, 150, 153.

"Di-thermal" processing, new unit operation already experimentally proved on meats, may challenge steam in tomorrow's canning plant. Diagrams, photographs.

4973* Studies on the Dehydration of Sweet Corn. A. I. Nelson, L. L. Kempe, H. W. Norton, and L. B. Howard. *Food Technology*, v. 8, Jan. 1954, p. 9-14.

Effects of six preparation and three storage variables on acceptability of dehydrated sweet corn were determined by means of fractionally replicated experiment. Tables. 9 ref.

4974* Some Recent Developments in Aluminum Foil Packaging of Foods. J. M. Fultz. *Food Technology*, v. 8, Jan. 1954, p. 19-21.

Discusses composition, manufacture, and applications. Photographs.

4975* Stabilized Orange Juice Powder. I. Preparation and Packaging. Sumner I. Strashun and William F. Talburt. **II. Changes During Storage.** Ann M. Mylne and Virginia S. Seamans. *Food Technology*, v. 8, Jan. 1954, p. 40-50.

Reports development of orange juice powder with storage stability even at elevated temperatures. Graphs, photograph, tables. 41 ref.

4976* From Fats to Energy. Albert L. Lehninger. *Journal of Agricultural and Food Chemistry*, v. 1, Dec. 23, 1953, p. 1194-1198.

Mechanism of metabolism of fats is discussed. Diagrams, micrographs.

4977* Insect-Proofing Paper. Laboratory Evaluation of Pyrethrins-Piperonyl Butoxide Formulations. Harry H. Incho, Eileen J. Incho, and Norris W. Matthews. *Journal of Agricultural and Food Chemistry*, v. 1, Dec. 23, 1953, p. 1200-1203.

Includes tables, photographs. 14 ref.

Food Technology

4978* Estimation of Sterilizing Values of Processes as Applied to Canned Foods. II. Packs Heating by Conduction: Complex Processing Conditions and Value of Coming-Up Time of Retort. T. G. Gillespy. *Journal of the Science of Food and Agriculture*, v. 4, Dec. 1953, p. 553-565.

Describes method of determining efficiency of sterilization. Tables, graph. 7 ref.

4979* The Chemical Estimation of Vitamin-E Activity in Cereal Products. I. The Tocopherol Pattern of Wheat-Germ Oil. P. W. Russell Eggitt and L. D. Ward. *Journal of the Science of Food and Agriculture*, v. 4, Dec. 1953, p. 569-579.

A method of separating tocopherols by paper chromatography is presented. Photographs, tables, graph. 16 ref.

4980* Nitrogen, Water and Electrolyte Metabolism on Protein and Protein-Free Low-Calorie Diets in Man. I. Water Restriction. II. Adequate Water Intake. Murray Quinn, Charles R. Kleeman, David E. Bass, and Austin Henschel. *Metabolism: Clinical and Experimental*, v. 3, Jan. 1954, p. 49-77.

Present study was undertaken because of paucity of complete data on man during periods of suboptimal nitrogen, caloric and water intakes. Also determines whether a large water intake might mitigate and more favorably affect over-all metabolic performance. Tables, graphs. 94 ref.

4981 The Metabolism of Fats. David E. Green. *Scientific American*, v. 190, Jan. 1954, p. 32-36.

Discusses the oxidation of fats by the human body. Micrographs, diagrams.

See also:
4398 (vitamins and hormones)

FUELS AND COMBUSTION

4982* Pulverized Lignite as a Means for Igniting Mill-Furnaces. (German.) E. Barth. *Brennstoff-Wärme-Kraft*, v. 5, no. 11, Nov. 1953, p. 387-388.

Describes advantages and equipment of coal dust ignition, storage of dust, and considerations for placement of equipment. Photographs.

4983* Trends in Firing in the Ceramic Industries. W. L. German. *Ceramics*, v. 5, Nov. 1953, p. 400-404, 406-407.

Discusses use of various fuels and instruments to maintain firing control. Photographs, tables.

4984 Improved Process for Coal Distillation. *Chemical Engineering*, v. 61, Jan. 1954, p. 268, 270.

Describes new technique for low-temperature coal distillation. Chief claim is a superior product—a fuel with a uniform volatile matter content. Diagram.

4985 Combustion of Low-Grade Coals. L. P. Crecelius. *Combustion*, v. 25, Dec. 1953, p. 63-65.

Results of tests are given in which untreated coal is compared with the same coal chemically treated. The latter showed up better and indicated advisability of a chemical approach to problem of burning low-grade coals. Graphs.

4986* Factors Conditioning the Formation of Cracks in Coke. (Russian.) E. M. Taits. *Doklady Akademii Nauk SSSR*, v. 93 no. 6, Dec. 21, 1953, p. 1077-1079.

Fissures in coke are shown to be formed by internal stresses resulting from forces hindering shrinkage. Graphs. 3 ref.

4987 Chemical Structure of Coal. Milton Orchin. *Engineering Experiment Station News (Ohio State University)*, v. 25, Dec. 1953, p. 25-31.

Basic structural units of coal appear to be very similar although a wide range of molecular weight fragments exist. Some physical and chemical properties are explained by hydrogen bonding between units. Tables, graphs, diagram. 7 ref.

4988* On the Manufacture of Oil-Gas. (Japanese.) Saburo Tanaka. *Fuel Society of Japan, Journal*, v. 32, no. 317, Sept. 1953, p. 480-485.

Oil-gas process produces gases with much higher calorific value from simpler installation. These new devices are described. Graph, diagrams.

4989* Measurement of Driving Pressure of Coal by Means of Movable Wall Oven. (Japanese.) Takao Iwasaki, Seiichi Nomura, Yoshitake Kon, and Kunio Nemoto. *Fuel Society of Japan, Journal*, v. 32, no. 317, Sept. 1953, p. 495-502.

Relations between driving pressure and properties of coal or coke were studied. Graphs, tables.

4990* Combustion of Carbons in High Speed of Air Stream. (Japanese.) Yoshio Kawana. *Fuel Society of Japan, Journal*, v. 32, no. 318, Oct. 1953, p. 553-557.

Discusses relation between concentrations of carbon monoxide and carbon dioxide in exhaust gases and velocity of air stream, combustion rate, and combustion temperature. Tables, graphs, diagram. 8 ref.

4991* On the Caking Property of Coal With Special Reference to the Plastic State. (Japanese.) Gen Takeya and Masao Kugo. *Fuel Society of Japan, Journal*, v. 32, no. 318, Oct. 1953, p. 557-569.

Mechanism of carbonization up to caking temperatures was discussed. Describes Gieseler-plastometer method of extracting carbonized coals by benzene and pyridine. Graphs, tables. 26 ref.

4992* Why Gas Fuel Is Expanding Its Usefulness With Light Metal Alloys. C. George Segeler. *Gas Age*, v. 112, Dec. 17, 1953, p. 34-35, 75-77.

Reports increasing number of applications for gas fuel since technical and competitive problems of gas equipment have been solved. Photographs.

4993* W-D/I.F.E. Complete Gasification Plant (G.I. System). *Gas Journal*, v. 276, Dec. 16, 1953, 725-729.

Presents description of process and data relating to pilot plant under construction. Photographs, diagram.

4994* Manufacture of Concentrated Gas Liquor. N. Calvert. *Gas Journal*, v. 276, Dec. 23, 1953, p. 791, 793, 795-796; disc., p. 796.

Discusses disposition of crude ammoniacal liquor in manufacture of gas.

4995* Technology of Desulfurizing Synthetic Water Gas With Activated Carbon. (German.) Werner Spichal. *Gas und Wasserfach*, v. 94, Ausgabe Gas, no. 23, Dec. 1, 1953, p. 679-684.

Mechanics of modern procedures are discussed. Table, diagrams, graphs. 9 ref.

4996* Combustion Areas in Front of the Blast Furnace Tuyeres. (Polish.) Wladyslaw Kuczewski and Kazimierz Moszoro. *Hutnik*, v. 20, no. 12, Dec. 1953, p. 361-367.

Discusses theoretical and practical importance of Czyzewski pattern for the blast furnace process. Describes influence of temperature and pressure on velocity of coke consumption. Tables, diagrams, graphs. 8 ref.

4997 Moving Bed Contact Coking Apparatus. D. C. Jones, T. E. Kelly, and M. B. Neuworth. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 12-15.

Describes apparatus. Discusses effect of temperature on product distribution and properties. Diagrams, tables, graph. 6 ref.

4998 Desulfurization of Low Temperature Char by Partial Gasification. C. W. Zielke, G. P. Curran, Everett Gorin, and G. E. Goring. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 53-56.

Includes tables, graphs. 11 ref.

4999 Smokeless Burning of Waste Process Gases. II. Robert D. Reed. *Industrial Heating*, v. 20, Dec. 1953, p. 2436, 2438, 2440.

Discusses flaring problems including pilot ignition, heat radiation, and presence of liquids in the gas stream.

5000* The Structure and Stability of Flat Burner Flames. B. H. Holland. *Institute of Fuel, Journal,* v. 26, Dec. 1953, p. 282-288.

Behavior of various gas flames upon cylindrical and flat burners has been studied and types of instability observed. Graphs, diagrams. 16 ref.

5001* Conditions for the Stable Burning of Carbon in an Air Stream. D. B. Spalding. *Institute of Fuel, Journal,* v. 26, Dec. 1953, p. 289-294.

It appears that a burning carbon surface may be extinguished either by increasing the rate of air flow over the carbon or by decreasing it. Graphs.

5002* A Theory of Vortex Combustion-Chamber Design. I. H. A. Havemann. *Institute of Fuel, Journal,* v. 26, Dec. 1953, p. 294-305.

Theory of a vortex combustion chamber for burning heavy fuel oil or powdered fuel is considered with reference to wall shape; size and distribution of particles suspended and held in stable equilibrium; motion of particles on burning; and entrance conditions. Graphs, diagrams, photograph.

5003 Emissivity and Flame Length. M. W. Thring. *Iron & Steel,* v. 26, Dec. 11, 1953, p. 581-585; disc., p. 665-658.

Abridged from Iron and Steel Institute Paper. Effect on heat transfer in open-hearth furnace is discussed. Diagrams, graphs.

5004* The Continuous Carbonization of Wood in Small Retorts Without the Recovery of By-Products. Robert S. Aries. *Journal of Forestry,* v. 52, Jan. 1954, p. 7-9.

Presents description of materials, equipment, and techniques of economical process for charcoal production.

5005* The Influence of Modern Refinery Technique on Marine Fuel Oil Quality. C. W. G. Martin. *Petroleum Times,* v. 57, Dec. 25, 1953, p. 1267-1272.

Disputes fallacy that catalytic cracking will cause fundamental alterations in marine fuel oil. Table.

5006* Combustion of Solid Fuel Introduced Directly in the Brick Clay During Molding. (Russian.) E. Kh. Odel'skii. *Steklo i Keramika,* v. 10 no. 12, Dec. 1953, p. 18-20.

Discusses characteristics and behavior of various fuels which can be included in the clay. Table, graphs. 3 ref.

5007* American Lignite Unleashed Energy Bonus. A. Wyn Williams. *Utilization,* v. 7, Dec. 1953, p. 64-67.

Describes potentialities as boiler fuel and as source of chemical raw materials. Photographs, diagram.

5008* Liquid Coal for a Solid Future. M. Lelyn Branin. *Utilization,* v. 7, Dec. 1953, p. 75-76, 79-80, 83-84.

Summarizes research and development work on liquid fuels and chemicals from coal. Photographs, map, diagram.

5009* The Process of Gasification of Coal by Water Vapor. (Russian.) N. M. Ershova. *Zhurnal Prikladnoi Khimii,* v. 26, no. 12, Dec. 1953, p. 1284-1289.

Experimental study. Determination of kinetic characteristics of various reactions. Diagrams, graphs, tables. 2 ref.

Books and Miscellaneous Publications

5010 (Gasification of Solid Fuels. Substances Balance and Equilibrium. A Presentation of Practical Computing Methods.) **Vergasung fester Brennstoffe. Stoffbilanz und Gleichgewicht. Eine Darstellung praktischer Berechnungsverfahren.** Wilhelm Gumz. 102 p. 1953. Springer-Verlag, Berlin. (TP319 G95v)

Demonstrates value of mathematical method establishing effects of pressure, temperature, water vapor, sulfur, etc. on the gasification process. Discusses kinetics of gasifying reactions; equilibrium system and its solutions; behavior of sulfur; and various mathematical methods.

See also:
4481 (magnetic properties of coal)
4931 (western coals)
5528 (fuel industries and atomic energy)

GEOLOGY AND MINERALOGY

5011* Lead Isotopic Ratios and Geologic Time. Paul E. Damon. *American Geophysical Union, Transactions,* v. 34, Dec. 1953, p. 906-914.

Consistency of recent data with Nier's data and with Nier-Holmes hypothesis for isotopic abundance of common Pb ores is examined. Graphs, tables. 17 ref.

5012* The Radium Content of Varved Clay. L. A. Sanderman and C. L. Utterback. *American Geophysical Union, Transactions,* v. 34, Dec. 1953, p. 915-920.

Radium content of varved clays, selected from an exposure of about 470 pairs of beds, has been determined. Tables, graphs. 6 ref.

5013* Genetic Classification of Hypergenic Ore Deposits. (Russian.) B. P. Krotov. *Doklady Akademii Nauk SSSR,* v. 93, no. 2, Nov. 11, 1953, p. 335-338.

Presents author's classification of sedimentary ore deposits. 10 ref.

5014* The Phase Transformations of Hydrate Sulfates of Iron (Fibro Ferrite $Fe(SO_4)(OH)\cdot 4{,}5H_2O$ and Malanterite $FeSO_4\cdot 7H_2O$) During Heating. (Russian.) A. I. Tsvetkov and E. P. Val'iashikhina. *Doklady Akademii Nauk SSSR,* v. 93, no. 2, Nov. 11, 1953, p. 343-346.

Investigated specimen of fibroferrite consisted of 94.43% $Fe(SO_4)(OH)\cdot 4{,}5H_2O$. Table, graphs. 3 ref.

5015* On the Formation of Coal. IV. Formation of Nitrogen and Sulphur in Coal. (Japanese.) Wataru Hunasaka and Chikao Yakogawa. *Fuel Society of Japan, Journal,* v. 32, no. 318, Oct. 1953, p. 541-553.

"Artificial coal" experiments were carried out from cellulose as well as lignin with addition of varying amounts of egg-albumen. Formation of sulphur in coal was discussed from experiments of sulphur fixation from several sulphides and sulphates into artificial coal. Graphs, table. 25 ref.

5016* The Structure and Optical Behaviour of Iridescent Agate. C. V. Raman and A. Jayaraman. *Indian Academy of Sciences, Proceedings,* v. 38, sec. A, Sept. 1953, p. 199-206 + 4 plates.

Detailed study has been made by optical and X-ray methods of two plates of banded agate which display iridescence over part of their area.

5017* Studies on South Indian Radioactive Minerals. II. Allanite From Madura. U. Aswathanarayana. *Indian Academy of Science, Proceedings,* v. 38, sec. A, Sept. 1953, p. 226-232 + 1 plate.

Allanite, a Ce-bearing epidote, has been studied in detail. Tables. 13 ref.

5018* Diagnosis of Sediments and Its Significance for Sedimentary Ore Formation. (Russian.) N. M. Strakhov. *Izvestiia Akademii Nauk SSSR, Seriia Geologicheskaia,* 1953, no. 5, Sept.-Oct., p. 12-49.

Presents characteristics of physical-chemical properties of contemporary sediments, mineral formation processes occurring in them, and distribution of substances. Tables, graphs. 29 ref.

5019* Study of Ore Structures With Aid of Electron Microscope. (Russian.) F. V. Syromiatnikov and A. F. Filimonov. *Izvestiia Akademii Nauk SSSR, Seriia Geologicheskaia,* 1953, no. 5, Sept.-Oct., p. 135-140.

Resolving power of 0.005 to 0.006 microns was sufficient for examintion of clays; sooty ores; bauxites; and Mn, Fe, and sulfide ores. Photographs, micrographs. 3 ref.

5020* Design of Experiments for Statistical Analysis of Geological Data. W. C. Krumbein and Robert L. Miller. *Journal of Geology,* v. 61, Nov. 1953, p. 510-532.

Discusses a number of experimental designs based on analysis of variance techniques, which are adaptable to geological problems in sedimentation, petrology, paleontology, and other fields. Diagrams, tables. 25 ref.

5021 Mineralization and Hydrothermal Alteration in the Hercules Mine, Burke, Idaho. Bronson Stringham, F. Mc-

Geology and Mineralogy

Intosh Galbraith, and Garth M. Crosby. *Mining Engineering*, v. 5; *American Institue of Mining and Metallurgical Engineers, Transactions*, v. 196, Dec. 1953, p. 1278-1282.

Includes graphs, photograph. 8 ref.

5022 Domain Structure of Lead Titanate. Ye. G. Fesenko. *National Science Foundation Translation*, no. 64, Sept. 1953, 2 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 785-786.)

Reports data on optical properties of single crystals of $PbTiO_3$ and some observations on their domain structure. Micrographs. 7 ref.

5023* The Variation of the Elastic Constants of Rocks With Frequency. J. McG. Burckshaw and P. C. Mahanta. *Petroleum*, v. 17, Jan. 1954, p. 14-18.

Presents method for laboratory measurement. Diagram, graphs. 9 ref.

Books and Miscellaneous Publications

5024 (Tables on the Optical Determination of Rock Forming Minerals.) **Tabellen Zur Optischen Bestimmung der gesteinsbildenden Minerale.** W. Ehrenreich Troger. 147 p. 1952. E. Schweizerbacht'sche Verlagsbuchhandlung (Erwin Nagele), Stuttgart. (TA425 T47t)

Presents charts, graphs, nomograms, drawings of crystal shapes, and tables of the chemical composition; optical characteristics, chemical behavior, and parageneses of 244 different minerals; with separate listings of their characteristic colors, pleochroisms, and other properties.

5025 The Geology of Venezuela and Trinidad. Ralph Alexander Liddle. 2nd Ed. 890 p. 1946. Paleontological Research Institution. Ithaca, New York. (QE251 L61g2)

Attempts to present accumulated knowledge of geology and mineral resources of Venezuela and Trinidad. Includes maps, photographs, tables, and a fairly complete bibliography.

GEOPHYSICS

5026* An Oscillating Psychrometer for Micro-Meteorological Purposes. C. T. de Wit. *Applied Scientific Research*, v. 4, sec. A, no. 2, 1953, p. 120-126.

A psychrometer is described which is adequately ventilated by oscillating the dry and wet thermocouples with an amplitude of about 1.5 cm. and a frequency of about 40 hertz. Diagrams, table. 5 ref.

5027* Problem of the Origin of Cosmic Rays and Radioastronomy. (Russian.) I. S. Shklovskii. *Astronomicheskii Zhurnal*, v. 30, no. 6, Nov.-Dec. 1953, p. 577-592.

Describes use of astronomical observations to make definite deductions on nature and origin of cosmic rays. 38 ref.

5028* Spatial Distribution of Charged Particles Close to the Axis of the Broad Atmospheric Shower of Cosmic Rays. (Russian.) Iu. N. Vavilov, S. I. Nikol'skii, and E. I. Tukish. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 233-236.

Experiments were conducted at an altiude of 3860 m. over sea level. Shows that experimental results do not agree with predictions arising from Fermi's theory. Graphs. 7 ref.

5029* Two Different Vibrational Cycles of the Earth's Electromagnetic Pole and Their Daily Cycle According to World Time. (Russian.) V. A. Troitskaia. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 261-264.

Cycles were definitely established. Each lasts approximately 12 hours. Graphs. 6 ref.

5030* The Localization of Non-Uniformities in the Ionosphere. (Russian.) A. A. Gorozhankina. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 459-461.

Presents findings obtained from observations utilizing two frequency soundings simultaneously. Graphs. 6 ref.

5031 Salinity Meter for Sonar Measurements. Kenneth E. Harwell and Donald W. Hood. *Electronics*, v. 27, Jan. 1954, p. 172-174.

Conductivity-measuring device uses R.F. signal to determine salt content of ocean water without immersion of electrodes. Tables, diagrams, graphs, photograph. 8 ref.

5032* Some Interesting Atmospheric Soundings of Pressure and Temperature Made With Väisälä Radiosondes at Ahmedabad. S. V. Venkateswaran and U. D. Desai. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Oct. 1953, p. 327-342.

Results and discussion of some 120 successful ascents. Graphs, table. 3 ref.

5033 Recombination and Diffusion and Spread Echoes From the Ionosphere. T. L. Eckersley. *Physical Society Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1025-1038.

Explanation of the spread F echoes often obtained on frequency-sweep records of equivalent height in the ionosphere, especially at night and in the auroral regions. Graph, diagram. 5 ref.

5034 Microwave Radiometers. Donald B. Harris. *Radio-Electronics*, v. 25, Feb. 1954, p. 104, 107-108, 110, 112-115.

New instrument for exploring the universe by measuring radiation from distant sources is presented. Photograph, diagrams, graphs.

5035* Electric Currents in the Ionosphere. I. The Conductivity. W. G. Baker and D. F. Martyn. **II. The Atmospheric Dynamo.** W. G. Baker. **III. Ionization Drift Due to Winds and Electric Fields.** D. F. Martyn. *Royal Society of London, Philosophical Transactions*, v. 246, ser. A, no. 913, Dec. 1953, p. 281-320.

Mathematical analysis in support of atmospheric "dynamo theory" is made. Diagrams, graphs. 30 ref.

Books and Miscellaneous Publications

5036 First International Seaweed Symposium, Proceedings. 129 p. July 1952. Institute of Seaweed Research, Inveresk, Midlothian, Scotland. (QK567 In8p)

Includes sections on phycology; algal chemistry; utlilization; seaweed harvesting technology; and world seaweed resources.

See also:
5556 (radioastronomy)

GRAPHIC ARTS

5037 On the Mechanism of the Photographic Effect of Ultrasonic Waves. G. S. Bennett. *Acoustical Society of America, Journal*, v. 25, Nov. 1953, p. 1149-1151.

Experimental data are submitted indicating existence of a direct action of ultrasonic waves on a photographic emulsion. Graphs. 13 ref.

5038* Ink Drying Troubles. Charles W. Latham. *American Printer*, v. 135, Jan. 1954, p. 34-35, 57-58.

Anti-offset sprayers are suggested.

5039* Art Techniques for Book Illustration. III. *Bookbinding & Book Production*, v. 58, Dec. 1953, p. 73-74.

Discusses several new methods for superior artwork reproduction including acetate separations, blue proofs, Bourges process, Kemart, direct contact, and fluorescence.

5040* Position of the Maximum of Sensitization of Photographic Emulsions Sensitized by Photomethylene Merocyanins. (Russian.) M. V. Deichmeister, I. I. Levkoev, E. B. Lifshits, and S. V. Natanson. *Doklady Akademii Nauk SSSR*, v. 93, no. 6, Dec. 21, 1953, p. 1057-1059.

Data confirm expressed hypothesis of very great influence of polarizing action of AgBr on degree of displacement. Table. 19 ref.

5041* The Inking Unit. Howard J. Watrous. *Graphic Arts Monthly*, v. 26, Jan. 1954, p. 80, 84, 86, 88, 90.

Many offset press problems originate in the inking system. A discussion of this situation is presented.

5042* Proper Care and Handling of Plates in the Pressroom. Otto Smith. *Graphic Arts Monthly*, v. 26, Jan. 1954, p. 66, 69, 71-72.

An outline of a procedure with satisfactory results is presented.

5043* The Diazo Process. H. Newell Dodge. *International Blue Printer*, v. 27, Jan. 1954, p. 26-27, 60-61.

A direct-positive, dry-developing diazotype method for reproduction of line drawings, typewritten and printed matter, or continuous-tone prints.

5044* Print Mounting Methods and Materials. I. Dry Mounting. Irwin Welcher. *International Blue Printer*, v. 27, Jan. 1954, p. 23-25.

Rubber cement and dry mounting are covered. Photographs.

5045 The Electron Microscopy of Photographic Grains, Specimen Preparation Techniques and Applications. F. A. Hamm and J. J. Comer. *Journal of Applied Physics*, v. 24, Dec. 1953, p. 1495-1513.

Includes micrographs. 26 ref.

5046 Electron Microscopical Studies of the Latent Image Obtained by Exposures to Alpha Particles, X-Rays, and Light. H. Hoerlin and F. A. Hamm. *Journal of Applied Physics*, v. 24, Dec. 1953, p. 1514-1519.

Includes micrographs, table. 12 ref.

5047* Control Instruments for Offset Lithography. III. Henry R. Long. *National Lithographer*, v. 60, Dec. 1953, p. 26-34.

Describes spectrophotometers, colorimeters, photometers, color temperature meters, color temperature controls, color standards, color register controls, step-tablets, step-wedges, and color step-tablets. Graph, diagram, photographs.

5048 An Automatic Recording Photographic Densitometer. George Barnes. *Optical Society of America, Journal*, v. 43, Dec. 1953, p. 1176-1180.

Projection densitometer which automatically plots a function of photographic density vs. position by a polar scanning of the negative in steps of two degrees or more is described. Micrographs, graph, photographs, diagram. 10 ref.

5049* Dry Offset on the Offset Duplicator. H. F. George. *Photoengravers Bulletin*, v. 43, Dec. 1953, p. 36-41.

Discusses equipment employed and techniques involved. Photographs.

5050* Aerial Photogrammetry Streamlines Ohio's Highway Program. Robert W. Meyer. *Photogrammetric Engineering*, v. 19, Dec. 1953, p. 771-776.

Application of aerial photogrammetry in solution of highway civil engineering problems.

5051* Principles of Design and the Applications of the MM 101 Surveying Camera. Everett L. Merritt. *Photogrammetric Engineering*, v. 19, Dec. 1953, p. 779-800.

Includes diagrams, tables, graphs, photograph.

5052* Etching Magnesium for Photengraving. H. E. Swayze. *Printing Equipment Engineer*, v. 84, Dec. 1953, p. 84-85, 143.

Abstracts of address delivered before American Photoengravers Convention, Boston, Oct. 1953. Discusses development of Mg as an engraving metal. Describes various factors effecting its use. Photographs.

5053* The ABC of Offset. XVII. George Jos. Lenzer. *Printing Equipment Engineer*, v. 84, Dec. 1953, p. 106, 108, 132.

Describes chemical procedures for correcting positive halftone dots. Photographs, diagrams. (To be continued.)

5054* Rotogravure Inks. IV. Axel Lundbye. *Printing Equipment Engineer*, v. 84, Dec. 1953, p. 114, 144.

Discusses relative strength, viscosity, surface tension, and density of proving and production inks.

5055* The Press Drive. A Production Tool. M. H. Johnson and R. E. Cragnolin. *Printing Equipment Engineer*, v. 84, Dec. 1953, p. 116, 118.

Discusses importance, selection, and application to large web presses. Photographs.

5056* Exhibits Prove Silk Screen Industry Is Fastest Growing Process. J. I. Biegeleisen. *Printing Magazine*, v. 77, Dec. 1953, p. 36-37, 42-43.

Discusses equipment and techniques employed in process.

5057* A New Etching Development for Magnesium. H. E. Swayze. *Process Engravers' Monthly*, v. 60, Nov. 1953, p. 334, 339.

Describes preparation of printing plates. (To be continued.)

5058* Web Press Printing Developments. Olin E. Freedman. *Productionwise*, v. 2, Dec. 1953, p. 77-78, 80.

Discusses various production considerations, techniques, equipment, scope of developments, and their adaptation to chief printing processes.

5059 Improved Color Films for Color Motion-Picture Production. W. T. Hanson, Jr. and W. I. Kisner. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Dec. 1953, p. 667-701 + 3 plates.

Formulas and procedures for use with these new films are given. Some problems associated with printing, process adjustment, and control are discussed. Tables, graphs, diagrams, photograph. 12 ref.

5060 Glow Lamps for High-Speed Camera Timing. H. M. Ferree. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Dec. 1953, p. 742-748.

Some unique characteristics of glow lamps are discussed in relation to their use in high-speed photography. Physical and electrical characteristics are given. Photographs, tables, graph, diagrams. 3 ref.

See also:
5285 (type founding)
5793 (photography in welding structures)

HEAT POWER

5061 A Practical Noise Reduction Treatment for Diesel Engines. James E. Ancell. *Acoustical Society of America, Journal*, v. 25, Nov. 1953, p. 1163-1166.

Consists of a set of sheet metal covers, lined internally with acoustical absorbing material, which were mounted directly over noisy areas of the engine. Photographs, graphs.

5062 Method for Measuring Thrust in Flight, on Afterburner-Equipped Airplanes. L. Stewart Rolls and C. Dewey Havill. *Aeronautical Engineering Review*, v. 13, Jan. 1954, p. 45-49.

Experimental technique has been developed to determine net propulsive force acting on an afterburner-equipped airplane in flight. This technique does not require use of special high-temperature material. Diagrams, graphs, photograph.

5063 An Air-Powered Servo-Actuator. Ralph Kress. *Aeronautical Engineering Review*, v. 13, Jan. 1954, p. 52-59.

Describes linear servo-actuator designed for afterburner variable nozzle actuation. Diagrams, photographs, graphs.

5064 Ford Adopts Overhead Valves for All Car and Truck Engines. Joseph Geschelin. *Automotive Industries*, v. 110, Jan. 1, 1954, p. 52-55, 116, 118.

New Ford overhead valve has a basic design incorporating short-stroke, low-friction characteristics said to promote high performance with greater economy and longer life. Table, diagrams.

5065* Pressure Fluctuations in a Jet Engine. H. M. Nicholson and A. Radcliffe. *British Journal of Applied Physics*, v. 4, Dec. 1953, p. 359-365.

Discusses observed pressure fluctuations and their significance in relation to practical engine operation and combustion system design. Diagram, photograph, graphs, oscillograms.

Heat Power

5066 The Oxidation, Decomposition, Ignition and Detonation of Fuel Vapors and Gases. XXII. The Characteristics of the Ignition and Combustion of Benzene in a Carburetor Engine as Affected by Heat Load. R. O. King and A. B. Allan. *Canadian Journal of Technology*, v. 32, Jan. 1954, p. 22-48.

Effect of "heat load" combustion and ignition characteristics and relation between thermal efficiency and compression ratio as mixture strength was varied. Tables, graphs, diagrams. 8 ref.

5067* For Low-Cost Generation. Study Heat Cycle Arrangement. D. E. Hart. *Electrical World*, v. 140, Dec. 28, 1953, p. 96-99.

Discusses regenerative feedwater heating and steam resuperheating equipment for electric power plants. Tables, diagram, graphs.

5068* Top Drum of a Double Drum Low Power Boiler. (Russian.) K. F. Roddatis and I. F. Shapkin. *Energeticheskii Biulleten*, 1953, no. 9, Sept., p. 20-26.

Discusses defects in design and construction of the top drum. Tables, diagrams. 3 ref.

5069* Investigation of Effective Joint Operation of Internal Combustion Engines in a Group Drive. (Russian.) L. I. Shturman. *Energeticheskii Biulleten*, 1953, no. 10, Oct., p. 1-9.

Discusses results of first experiments in drilling installations. Graphs, diagrams.

5070* Supercharged Gas Engine. *Engineer*, v. 196, Dec. 11, 1953, p. 766-767.

Experimental work and results on development of a gas engine comparable in power to a diesel. Graphs, diagram, photograph.

5071 How Do Motor-Fuels Burn? Cecil E. Boord. *Engineering Experiment Station News (Ohio State University)*, v. 25, Dec. 1953, p. 9-16.

Theory and supporting evidence are used to explain combustion processes for various fuels and fuel mixtures. 19 ref.

5072 Flow Through Nozzles in Rocket Motors. R. Kling and R. Leboeuf. *Engineers' Digest*, v. 14, Dec. 1953, p. 460-463. (Translated from *Recherche Aeronautique*, no. 35, Sept.-Oct., 1953, p. 35-41.)

Parameters considered include nozzle geometry, injection pressure, liquid temperature, chamber pressure, and type of liquid injected. Diagrams, graphs. 3 ref.

5073 Propulsion of Ships. *Machinery Lloyd (Overseas Ed.)*, v. 25, Dec. 19, 1953, p. 93, 95-99.

Advantages of turbine over reciprocating engine and development of a gas turbine are discussed. Diagrams, photograph.

5074* The Effects of Coal Characteristics in Industrial Boiler Practice. A. R. Myhill. *Mechanical World and Engineering Record*, v. 133, Dec. 1953, p. 537-539.

Reviews classification of coals. Discusses behavior of various types in burning and handling equipment. 5 ref.

5075* The Influence of Thermal Effects on the Manoeuvrability of Marine Turbine Machinery. Basil J. Terrell. *North East Coast Institution of Engineers & Shipbuilders, Transactions*, v. 70, Dec. 1953, p. 93-120.

Discusses design of marine turbines to minimize failures due to thermal effects. Diagrams, graphs, photograph. 5 ref.

5076 Trend to High Octane Is Sound. E. V. Murphree, J. P. Haworth, A. F. Kaulakis, and A. R. Cunningham. *Petroleum Refiner*, v. 33, Jan. 1954, p. 229-230, 232, 234, 236, 238.

Discusses industry beliefs concerning increase in fuel octane number and engine efficiency. Tables, diagrams, graphs. 4 ref.

5077* Steam Traps Are "Spark Plugs" of Steam-Using Plants. I. H. E. Hollensbe. *Plant*, v. 9, Jan. 1954, p. 34-39.

Reports high efficiencies and savings made possible by installation of steam traps. Discusses proper selection and application. Diagrams, graphs, photographs.

5078* Residual Fuel for Diesels Saves Up to $4500 a Month. Robert Dodd. *Power*, v. 98, Jan. 1954, p. 116-117, 214, 216.

Discusses difficulties involved in change-over from light to heavy oil. Diagram.

5079* Investigations of Preignition Are Bringing Results. *SAE Journal*, v. 62, Jan. 1954, p. 41-52.

This article is based on group of papers presented as a "Symposium on Preignition". Includes "Uncontrolled Combustion in Spark-Ignition Engines—A Note", S. D. Heron; "An Investigation of Preignition in Engines", A. O. Melby, D. R. Diggs, and B. M. Sturgis; "Deposit-Induced Ignition Evaluation in a Laboratory Engine", D. A. Hirschler, J. D. McCullough, and C. A. Hall; "Some Effects of Fuels and Lubricants on Auto-Ignition in Cars on the Road", R. K. Williams and J. R. Landis; and "The Occurrence of Preignition in Present-Day Cars in Normal Service", R. F. Winch.

5080* Development of Power Plants. E. L. Bass. *Shell Aviation News*, no. 185, p. 16-25.

Discusses important developments in aircraft engines. Tables, graph, photographs.

5081* New Designs of Large Two-Stroke Marine Diesel Engines. W. Kilchenmann. *Sulzer Technical Review*, 1953, no. 2, p. 1-31.

Describes use of marine diesel engine, heavy fuel oil problems, and prototype engine. Diagrams, tables, graphs, photographs.

5082* The New Steam Generating Station in the Monthly Factory of CIBA Ltd. H. Lienhard. *Sulzer Technical Review*, 1953, no. 2, p. 32-47.

Describes new steam boilers with equipment for steam distribution, steam storage, and water treatment. Photographs, diagrams, graph.

5083* Calculation of the Working Stroke of a Two-Cycle Engine. (Russian.) M. A. Khailov. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 5-15.

Detailed mathematical presentation. Graphs, diagrams.

5084* Problem of Determining the Optimum Diameter of the Intake Duct for Four-Cycle Internal Combustion Engines With an Inertia Supercharger. (Russian.) R. V. Rusinov. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 15-20.

A mathematical presentation. Tables. 5 ref.

5085* Practical Test of Hydroturbines With Carbon Steel Vanes. (Russian.) S. S. Astaf'ev and G. A. Bronovskii. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 24-27.

Describes operation of turbine and composition of steel. Tables, micrograph, photographs, diagram.

See also:
4304 (Russian rockets)
4311 (adjustable jet nozzle)
5782 (welding for boiler construction)

INFORMATION—PREPARATION AND DISSEMINATION

5086* Fundamentals of Handling Technological Documentation Illustrated by the Case of Powder Metallurgy. (Polish.) Edmund Bryjak. *Hutnik*, v. 20, no. 12, Dec. 1953, p. 367-374.

Discusses symbolization in production departments, systematization of documents, technological shortcuts, work regulation, and machines. Tables. 3 ref.

5087 Information Gathering Habits of Workers in Pure and Applied Science. Saul Herner. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 228-236.

Describes project to analyze and define information-gathering methods as they exist among scientific personnel in a single institution and to determine source of research information and reference services that are most useful. Tables, charts. 25 ref.

5088 Numbering Systems in the Engineering Department. S. Ulrich. *Product Engineering*, v. 25, Jan. 1954, p. 194-197.

Discusses serial, mnemonic, and auxiliary numbering systems. Table, diagram, photograph.

See also:
4399 (biology and language)

INSTRUMENTATION AND LABORATORY APPARATUS

5089* Automatic Milliwattmeter for Electromagnetic Radiation. J. C. Van den Bosch and F. Bruin. *Applied Scientific Research*, v. 3, sec. B, nos. 4-5, 1953, p. 260-264.

An electronic milliwattmeter using a thermistor is described. Diagrams, graph.

5090* Continuously Recorded Relay Measurements. E. G. Walsh. *Bell Laboratories Record*, v. 32, Jan. 1954, p. 27-32.

Apparatus design and development frequently require extremely precise measurements of force as a function of motion or displacement. Photographs, graphs, diagram.

5091* The Theoretical Characteristics of Bichromatic Pyrometers. H. Herne. *British Journal of Applied Physics*, v. 4, Dec. 1953, p. 374-377.

Theory is outlined. Response is calculated for different filter pass bands of different band widths. Graphs.

5092* The Influence of Barometric Pressure on Watch and Chronometer Rates. N. W. B. Stone, K. W. T. Elliott, and P. H. Bigg. *British Journal of Applied Physics*, v. 4, Dec. 1953, p. 379-382.

Experiments are described in which rate of arc of a high quality watch and marine chronometer were observed at a number of pressures from 0 to 760 mm. of Hg. Graphs. 5 ref.

5093 Measurement of Metal Thicknesses of Up to About 25/64 Inch With X-Rays and Geiger Counter. H. W. Fritze. *Henry Brutcher, Altadena, Cal., Translation no.* 3058, 5 p. + 1 plate. (From *Stahl und Eisen*, v. 72, no. 16, 1952, p. 943-945.)

Merits of use of Geiger counter as recording element in combinaton with hollow-anode X-ray tube. Graphs, diagram.

5094 A High-Speed Precision Tachometer. W. R. Bland and B. J. Cooper. *Electronic Engineering*, v. 26, Jan. 1954, p. 2-8.

An electronic device having range of 0 to 80,000 r.p.m. with accuracy of 0.01% is described. Photographs, diagrams. 6 ref.

5095* National Physical Laboratory Interferometer. D. C. Barnes and M. J. Puttock. *Engineer*, v. 196, Dec. 11, 1953, p. 763-766.

An interferometer for routine measurements of length dimension of slip and block gauges. Tables, diagrams, photographs. 4 ref.

5096* Determination of Correction Factors of the Commercial Viscometers. (Japanese.) Masumi Kinoshita. *Fuel Society of Japan, Journal*, v. 32, no. 318, Oct. 1953, p. 569-577.

Nine Redwood No. I viscometers and seven Saybolt Universal viscometers were checked at various ranges of viscosity. Data obtained were analyzed according to method of statistical analysis. Tables, graphs. 5 ref.

5097* An Electro-Static Beta-Ray Spectrometer, Using a Spherical Condenser. M. C. Joshi and B. V. Thosar. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Nov. 1953, p. 367-375 + 1 plate.

Instrument and its performance as tested by artificially accelerated electron beams is described. Diagram, graphs. 5 ref.

5098 Iron-Constantan Thermocouple Tables. *Industrial Heating*, v. 20, Dec. 1953, p. 2382, 2384, 2386, 2388.

Describes new reference tables published by Bureau of Standards. Graph. 4 ref.

5099 Wide-Range Chromaticity Measurements With Photoelectric Colorimeter. John B. Chatten. *I.R.E., Proceedings*, v. 42, Jan. 1954, p. 156-160.

Discusses special characteristics of an instrument that will measure chromaticity throughout the color range. Graphs, diagram, photograph.

5100 Test Instruments for Color Television. W. C. Morrison, K. Karstad, and W. L. Behrend. *I.R.E., Proceedings*, v. 42, Jan. 1954, p. 247-258.

Test instruments developed to simplify measurements of frequency, phase, linearity and response are discussed. Photographs, oscillograms, diagrams, graph.

5101 The Tungsten/Molybdenum Thermocouple for Immersion Pyrometry. I. The Characteristics of the Tungsten/Molybdenum Thermocouple. J. P. Simons. **II. The Tungsten/Molybdenum Immersion Pyrometer.** C. G. Hamstead and E. J. Burton. *Iron and Steel Institute, Journal*, v. 175, Dec. 1953, p. 402-407.

Laboratory and works studies have been made on possibility of using W/Mo thermocouple for measuring temperature of liquid steel. Diagrams, graphs, table. 21 ref.

5102 Response of Two-Material Laminated Cylinder to Simple Harmonic Environment Temperature Change. Herman H. Lowell. *Journal of Applied Physics*, v. 24, Dec. 1953, p. 1473-1478.

Presents theory and results of numerical calculations. 14 ref.

5103* A Scintillation Spectrometer Adapted to Coincidence Studies. (French.) M. Langevin, G. Allard, and G. Corbé. *Journal de physique et le radium*, v. 14, no. 12, Dec. 1953, p. 691-694.

Describes operation and results obtained. Diagrams, graphs.

5104 A Graphite Tube Resistance Furnace and Voltage Regulator for Equilibrium Studies in the Temperature Range 1500-1800C. W. E. Dennis, F. D. Richardson, and J. H. Westcott. *Journal of Scientific Instruments*, v. 30, Dec. 1953, p. 453-455.

Design and performance characteristics are described. Diagrams, graph. 3 ref.

5105 Rotary Vacuum Reaction Chambers. J. F. Duncan and D. T. Warren. *Journal of Scientific Instruments*, v. 30, Dec. 1953, p. 462-464.

Two designs of an apparatus which enables a large quantity of powdered solid to be quickly degassed and subsequently exposed to a gas have been developed. Diagrams, photograph.

5106 Measurement of Turbine Blade Forms. *Machinery (London)*, v. 83, Dec. 4, 1953, p. 1118-1123.

Describes equipment and techniques employed. Photographs, diagrams, table.

5107 A New Model of the N.P.L. Interferometer for Measuring Slip Gauges. D. C. Barnes and M. J. Puttock. *Machinery (London)*, v. 83, Dec. 11, 1953, p. 1170-1175, 1178.

Presents description of instrument and its operating characteristics. Diagrams, photographs, tables. 4 ref.

5108* Hydraulic Load Cells. *Mechanical World and Engineering Record*, v. 133, Dec. 1953, p. 534-536.

Describes compact and relatively simple method of measuring loads from a few pounds to 500 tons or more. Diagrams.

5109* An Interference-Optical Instrument for Measuring Thickness of Thin Metal Films. (German.) M. Dühmke and K.-G. Georgi. *Metall*, v. 7, nos. 23-24, Dec. 1953, p. 1000-1002.

Design and use of instrument is described. Diagrams, photographs. 4 ref.

5110* A Universal Optical Bench for Photomicrography and Allied Uses. Hilary Moss. *Microscope*, v. 9, Nov.-Dec. 1953, p. 257-265.

Purpose and general description of apparatus easily constructed in amateur workshops. Photographs, diagrams, drawings.

5111 On the Resolving Power of an Electron Objective of the Immersion Type. G. V. Spivak and Ye. M. Dubinina. *National Science Foundation Translation*, no. 57, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 673-675.)

Shows that electric field can be considerably increased, spark-

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ing avoided, and an image of better quality obtained if a pulsed voltage is used instead of constant voltage. Micrographs. 3 ref.

5112 A New Microscope Principle. J. M. Cowley. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1096-1100.

A high-resolution image may be derived from a large number of 'dark-field' images of normal resolution, obtained by varying angle of incidence of the electron beam in a standard electron microscope. 3 ref.

5113 Industrial Use of Optical Instruments. Howard S. Coleman. *Product Engineering*, v. 25, Jan. 1954, p. 168-173.

Nine different kinds of instruments for industry, with emphasis on new developments and designs, including magnifier, compound microscope, metallographic equipment, contour projectors, spectrographs, refractometer, polarimeters, colorimeter, and opacimeter. Diagrams, photographs, table, chart.

5114 Pressure Transducers. Jerry Grey. *Product Engineering*, v. 25, Jan. 1954, p. 174-179.

Describes strain gage, capacitance, piezoelectric, and magnetic instruments. Tables, diagrams, photographs. 4 ref.

5115 A Beta-Ray Microscope. William Kerr and H. J. Gomberg. *Science*, v. 119, Jan. 8, 1954, p. 51-55.

Presents description of design and operating characteristics. Discusses expected resolution, sensitivity, and noise problem. Graph, photograph, diagrams, table. 14 ref.

5116 FM/FM Telemetering. W. J. Mayo-Wells. *Tele-Tech*, v. 13, Jan. 1954, p. 85-87, 138-146, 148, 150.

Includes diagrams.

5117* A New Instrument for Measuring Low Pressures and a Method of Determining Molecular Weights. (German.) *Umschau in Wissenschaft und Technik*, v. 53, no. 24, Dec. 15, 1953, p. 742-743.

Design of instrument based on thermal molecular pressure is described. With slight modifications this radiometer-vacuummeter may be used to determine molecular weights. Diagrams.

5118* Application of Statistical Procedures to the Problem of Materials Technology. (German.) Hans Bühler and W. Schreiber. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 95, no. 33, Nov. 21, 1953, p. 1119-1124.

Statistical methods can be applied to fatigue testing and for determination of service life of metal molds. Tables, graphs. 15 ref.

See also:
4777 (rectifier measuring instruments)
4778 (voltmeters)
4791 (human engineering in instrumentation)
5045 (electron microscopy of photographic grains)
5048 (automatic densitometer)
5554 (radiation detectors)
5630 (infrared interferometer)

LUBRICATION AND FRICTION

5119* Testing of Lubricating Grease With the SKF Testing Machine. (German.) J. Bergstedt and H. Diergarten. *Erdöl und Kohle*, v. 6, no. 11, Nov. 1953, p. 705-712.

Design and operation of machine is described. Importance of change of lubricant properties during test is discussed. Diagrams, tables, photographs, graphs.

5120* The Lubrication of Ball and Roller Bearings at High Speeds. A. Fogg and J. S. Webber. *Institute of Petroleum, Journal*, v. 39, Nov. 1953, p. 743-764 + 1 plate.

Lubrication aspects governing performance of rolling bearings operating from 6000 to 30,000 r.p.m. under radial, thrust, and combined loading. Diagrams, tables, graphs.

5121* Quickie E-P Tests of Gear Lubes Can Mislead You. *Power*, v. 98, Jan. 1954, p. 120-121.

Applications of low-cost, extreme-pressure lube testers. Drawings.

5122 New Bearing Uses Less Oil. Z. G. Brandenstein and J. B. MacPherson. *Railway Age*, v. 135, Dec. 28, 1953, p. 50-51.

Describes general change made by all manufacturers in method of lubricating traction motor axle suspension bearings. Photographs, graph.

5123* Turbine Oils and Turbine Lubricating Oil Systems. III. Hydrogen Cooled Alternators. G. H. Clark. *Scientific Lubrication*, v. 5, Dec. 1953, p. 10-14.

Presents discussion of design, operating characteristics, advantages, and limitations. Photograph, diagrams. (To be continued.)

5124* Friction Bearing With Air Lubrication. (German.) H. Drescher. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 95, no. 35, Dec. 11, 1953, p. 1182-1190.

Discusses principles, advantages, limitations, and possible applications. Diagrams, graphs, photographs.

5125* Use of Anti-Friction Carbon-Graphitic Materials in Machine Construction. (Russian.) I. V. Temkin. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 22-24.

Presents physical-chemical properties of carbon-graphitic materials for reduction of friction. Table, graphs, diagram, photograph.

See also:
4704 (use of silicone lubricants)
4756 (effect of lubricants on fretting corrosion)

MECHANICAL ENGINEERING

5126 Hydraulic Model Tests Establish Optimum Design for Indiana Harbor Development. Lorenz G. Straub and Robert Y. Hudson. *American Iron and Steel Institute, Preprint*, Oct. 8, 1953, 30 p. (TS300 Am35ta)

Paper presented at Chicago Regional Technical Meeting of AISI, Oct. 8, 1953. Small scale hydraulic model studies of the harbor and portions of certain harbor structures were conducted to aid in solution in wave action problems arising from construction programs of two steel companies. Investigations concerned construction projects recently completed, projects under construction during course of the model studies, and proposed future plans for plant expansion and harbor development. Diagrams, graphs, photographs, tables, photomicrographs. 6 ref.

5127* Where Are Machine Tools Going in Design? Frederick S. Blackall, Jr. *American Machinist*, v. 97, Dec. 21, 1953, p. 109-111.

Foreign and domestic trends in machine-tool design are evaluated.

5127a A Common Tolerance System. F. W. W. Lee. *Automobile Engineer*, v. 43, Dec. 1953, p. 560-562.

American, British, and Canadian proposals critically examined. Graphs.

5128* Designing of High-Speed Paper Making Machines. (Russian.) F. G. Shukhman. *Bumazhnaia Promyshlennost*, v. 28, no. 12, Dec. 1953, p. 10-16.

Shows that production of newsprint machines could be increased from 600 to 1000-1200 m. per sec. by improving design. Table, diagrams.

5129 Automatic Controls. II. *Canadian Chemical Processing*, v. 37, Dec. 1953, p. 36, 38, 40.

Discusses types of process controls and how they operate. Diagrams.

5130* Automatic Control System With Provision for Scanning and Memory. N. H. Young. *Electrical Communication*, v. 30, Dec. 1953. p. 279-282.

Describes a system for adjusting a control element to produce a maximum or minimum value of a resulting parameter. Photographs, diagrams.

5131 Reference-Voltage Circuits for Automatic Controls. A. A. Kiriloff. *Electrical Manufacturing*, v. 53, Jan. 1954, p. 97-103, 296, 298.

A variety of electronic and magnetic circuits provide a

constant reference potential despite wide variations in input voltage and output loads. Tables, diagrams, graphs. 10 ref.

5132* Dynamical Analogies. R. Yorke. *Engineering*, v. 176, Dec. 11, 1953, p. 763-764.

Discusses analogy which exists between electric circuits and mechanical oscillating systems. Diagrams.

5133* The Two Axes of Twist in Elastic Prisms. D. G. Ashwell. *Engineering*, v. 176, Dec. 18, 1953, p. 769-771.

Existence of two centers of twist of twisted elastic prisms are shown mathematically. Diagrams.

5134* The Plastic Design of Grillages. Jacques Heyman. *Engineering*, v. 176, Dec. 25, 1953, p. 804-807.

Discusses some theoretical and experimental work in plastic behavior of grillages. Tables, photographs, diagrams, graphs.

5135 The Ferraris Motor and Its Application in Control Systems. H. Umlauft. *Engineers' Digest*, v. 14, Dec. 1953, p. 467-470. (Translated from *Feinwerktechnik*, v. 57, no. 8, Aug. 1953, p. 229-235.)

Introduces a motor with light-alloy rotors and capable of shaft powers of several hundred watts. Diagrams, graphs, tables.

5136* Hydrostatic Testing: Economics, Problems, and Procedures. J. C. Powell and N. K. Senatorff. *Gas*, v. 30, Jan. 1954, p. 96, 100, 102-104, 106-110.

Describes procedure for use in gas line piping. Diagrams, table, graph.

5137 How to Increase Automatic Screw Machine Output. Claude Morgan. *Iron Age*, v. 172, Dec. 24, 1953, p. 82-84.

Close attention to machine design, tool design, and tool lubrication will pay off in much faster screw machine output, better tool life, lower costs. Photographs.

5138 Single Degree of Freedom Flutter of Compressor Blades in Separated Flow. Jan R. Schnittger. *Journal of the Aeronautical Sciences*, v. 21, Jan. 1954, p. 27-36.

Shows prime effects of frequency, initial angle of attack, cascade effects, and Mach number on aerodynamic reactions in separated flow. Graphs, micrographs, photograph. 18 ref.

5139 Limit Design of Columns. Paul C. Paris. *Journal of the Aeronautical Sciences*, v. 21, Jan. 1954, p. 43-49.

Concept of "plastic-dynamic buckling" is introduced to emphasize strain-rate energy dissipation in early plastic buckling of columns. Diagrams, graphs, photographs. 4 ref.

5140 Basic Factors in Spring Design. R. H. Warring. *Machinery Lloyd (Overseas Ed.)*, v. 25, Dec. 19, 1953, p. 71-74.

Appreciation of spring requirements at an early stage may result in a better final design. Tables, diagrams, graph.

5141* Thick Cylinders. W. A. Milnes. *Mechanical World and Engineering Record*, v. 133, Dec. 1953, p. 540-543.

Presents complement to traditional method of establishing basic Lamé equations for radial and hoop stresses in thick cylinders subjected to heavy hydrostatic pressure. Includes applications to derivation of practical formulas for wall thickness and design stress recommendations. Diagrams.

5142* Automatic Process Controllers. J. R. Fawcett. *Mechanical World and Engineering Record*, v. 133, Dec. 1953, p. 547-551.

Discusses design and applications of equipment for accurate, reliable control of variable factors in continuous processes. Diagrams, photograph.

5143 Stop Compressor-Plant Vibration. N. H. Moerke and C. Newman. *Oil and Gas Journal*, v. 52, Jan. 11, 1954, p. 100, 102, 104, 106, 108.

Discusses major causes of vibration and means of minimizing them. Photographs, graphs. 12 ref.

5144 Horizontal vs. Vertical Pumps. Melvin S. Mann. *Petroleum Refiner*, v. 32, Dec. 1953, p. 111-114.

An engineering analysis of a controversial issue, considering space requirements; NPSH, priming, and flexibility; and corrosion maintenance. Diagrams.

5145 New Methods for Engine and Compressor Maintenance. Robert S. Ridgway. *Petroleum Refiner*, v. 33, Jan. 1954, p. 110-115.

Reviews useful methods affecting engine and compressor maintenance including re-sleeving power cylinders, metal spray conditioning, chrome plating cylinder walls, and new shop gadgets. Photographs.

5146* New Study of High-Speed Pumps for Superpressures. Igor J. Karassik. *Power*, v. 98, Jan. 1954, p. 73-78.

Design will permit a smaller number of stages, greater head per stage, smaller impeller diameter, shorter shaft, and lighter-weight parts. Diagrams.

5147* Determining Equilibrium States of Circular Shell With Axisymmetrical Load. (Russian.) N. A. Alumiae. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 517-528.

Considers non axi-sysmmetrical equilibrium states of a cylindrical shell of revolution under action of external hydrostatic pressure and axial load.

5148* Forced Vibrations of a Bent Rod With Linear Damping in a Hinged Support. (Russian.) L. N. Grodko. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 607-610.

4 ref.

5149 How to Specify a Servo Control System. George M. Attura. *Product Engineering*, v. 25, Jan. 1954, p. 129-134.

Details of load and system specifications necessary to describe a servo loop, including practical hints the industrial equipment designer can use in determining these specifications. Diagrams, tables, photographs.

5150 Worm Gearing. James E. Gutzwiller. *Product Engineering*, v. 25, Jan. 1954, p. 146-149.

Discusses selection of materials; support of worm and gear shafts; housing; and lubrication. Photograph, diagrams, table.

5151 Dynamic Loading of Compression Springs. I. Karl W. Maier. *Product Engineering*, v. 25, Jan. 1954, p. 162-167.

Includes an introduction to dynamic loading and general theory of elastic waves as applicable to helical compression springs. Diagrams, table, photograph. (To be continued.)

5152* On Some Eigenvalue Problems of Exceptional Difficulty, Exemplified by a Case of Elastic Instability. R. V. Southwell and Gillian Vaisey. *Quarterly Journal of Mechanics and Applied Mathematics*, v. 6, Dec. 1953, p. 453-480.

Relaxation methods to estimate critical load and mode of distortion ('waving') for a flat plate representative of a cantilever I-beam are presented. Diagrams, graphs, tables. 14 ref.

5153* Design of Exhaust Systems. F. H. Stebbins. *Sheet Metal Worker*, v. 45, Dec. 1953, p. 68-72.

Includes diagrams, tables, graph. (To be continued.)

5154 Some Problems in the Development of a 50,000 Ton Press. H. C. Hood. *Steel Processing*, v. 39, Dec. 1953, p. 642-646, 670.

Discusses design, construction, transportation, and erection. Diagrams, photographs.

5155* Modern Requirements For Grinding and Polishing Machines. (Russian.) P. Ia. Bokin. *Steklo i Keramika*, v. 10, no. 9, Sept. 1953, p. 4-6.

Describes shortcomings. Suggests improvements on machines produced by national industry. 5 ref.

5156* Mechanics of Tool Engineering. IV. Boring and Boring Tools. Andrew E. Rylander. *Western Machinery and Steel World*, v. 44, Dec. 1953, p. 75-80.

Includes diagrams, photographs.

Books and Miscellaneous Publications

5157 Pumps. Types, Selection, Installation, Operation, and Maintenance. Frank A. Kristal and F. A. Annett. 373 p. 1953. McGraw-Hill. (TJ900 K89p2)

Includes chapters on reciprocating, volute-type centrifugal,

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turbine, propeller, rotary, deep-well, boiler-feed, sewage and sludge, sanitary, and variable displacement and proportioning pumps, methods of priming pumps; what is head on a pump; economical pipe size for pumps; pump operation, selection, and installation; and centrifugal-pump troubles and remedies.

See also:
4496 (mechanical uses of C in industry)
4882 (transistors in telemetry)
5438 (tooling applications)

METALLURGY

5158* The Use of Silicon in Special Steel. (English.) *Aciers Fins & Spéciaux Francais*, 1953, no. 13, Mar., p. 25-32.

Discusses importance, efficiency, and properties of Si when used as an alloy with iron and steel. Graphs.

5159* Some Methods of Preparation, Properties and Applications of Molybdenum. D. J. Jones. *Alloy Metals Review*, v. 8, Dec. 1953, p. 2-8.

Reports that Mo is promising material to withstand high temperatures and conditions of stress involved in gas turbines. Tables, graphs. 13 ref.

5160* Opening Speech of Undersecretary Bese Vilmos, at the Bauxite-Alumina Meeting at Ajka, on Jun 20-21, 1953. (Hungarian.) *Aluminium (Budapest)*, v. 5, no. 10, Oct. 1953, p. 205-207.

Outlines future tasks of bauxite and alumina industry in Hungary. Discusses maintaining quality of bauxite, discovering new high quality bauxite deposits, developing technology of existing plants, effecting savings in electrical power consumption, training the labor force, and improving quality of aluminum produced.

5161* Problems of Quality in Bauxite Production. (Hungarian.) Endre Alliquander. *Aluminium (Budapest)*, v. 5, no. 10, Oct. 1953, p. 208-213.

Reviews methods by which quality of bauxite can be established. Suggests measures necessary for evaluating Hungarian bauxite deposits including a revision of modulus system introduced from Russia. Outlines future possibilities and difficulties in bauxite production and processing.

5162* Evaluation of Aluminum-Base Bearing Metals From a Metallographic Point of View. (Hungarian.) Zoltán Buray. *Aluminium (Budapest)*, v. 5, no. 10, Oct. 1953, p. 216-220.

Reviews properties necessary in bearing metals. Al bearing metals of various composition are discussed. Experiments in Hungary with Al-Ag-Pb alloy bearings are described. Tables, micrographs, graph.

5163* Safety Measures During Magnesium Processing. (Hungarian.) Gyula Emod. *Aluminium (Budapest)*, v. 5, no. 10, Oct. 1953, p. 220-221.

Describes safety measures necessary in the storage room. Discusses extinguishing of fires and safety measures during cutting, machining, and casting. 7 ref.

5164* Special Brass Alloys. (Hungarian.) Sándor Polgáry. *Aluminium (Budapest)*, v. 5, no. 12, Dec. 1953, p. 258-260.

Summarizes research results gained in the last two years in Hungary on handling and application of these materials. Discusses foundry and cold forming alloys and significance of Zn content.

5165 Iron, Steel and American History. E. N. Hartley. *American Iron and Steel Institute, Preprint*, 1953, 17 p. (TS300 Am35ta)

Paper presented at 1953 regional technical meeting of AISI, Youngstown, Chicago, Birmingham, San Fransico, and Philadelphia. Covers sections on rise and fall of ironworks; restoration begins; Hammersmith was prototype; similarity to modern enterprise; ironworks affected society; industry was a catalyst; economic facts of life; push toward innovation; industry as a frontier; working for the good of all; standard of living improved; industrial history skimped; opportunity at hand; and industry is basic.

5166 Wire Rope for the Steel Industry. A. J. Morgan. *American Iron and Steel Institute, Preprint*, Oct. 8, 1953, 8 p. (TS300 Am35ta)

Paper presented at Chicago Regional Technical Meeting of AISI, Oct. 8, 1953.

5167* How to Understand Aluminum, Its Alloys and Tempers. Samuel Storchheim. *American Machinist*, v. 97, Dec. 21, 1953, p. 113-124.

Presents, with a minimum of metallurgical terms, an introduction to factors necessary to proper application of Al. Tables, graphs, photomicrographs.

5168* New ASA Standards for Cast-Iron Pipe. Panel Discussion. *American Water Works Association, Journal*, v. 45, Dec. 1953, p. 1266-1280.

Includes "Development of A21 Specifications", Thomas H. Wiggin; "Cast-Iron Pipe Tests", J. Thompson Vann; "Manufacturing Considerations", H. W. Stuart; "Consulting Engineer's Viewpoint", Louis R. Howson; and "Manager's Appraisal", Wendell R. LaDue. Tables, photographs.

5169* Discussion on Semiconducters. (Dutch.) *Bedrijf en Techniek*, v. 8, no. 189(24); *Electronica section*, v. 6, no. 136, Nov. 21, 1953, p. 189.

Outlines briefly history and production of Ge by reduction from its compounds.

5170* B.I.S.R.A. Sheffield Laboratories. The Main Equipment. *British Steelmaker*, v. 19, Dec. 1953, p. 716-721, 723-724.

Describes electric-arc furnace; four-high rolling mill; 200-ton forging press; wire-drawing machine; and equipment for high-frequency melting-vacuum fusion gas analyses and fatigue testing. Photographs.

5171 Steel for Large Forgings. S. Ammareller and P. Grün. *Henry Brutcher, Altadena, Cal., Translation no.* 3012, 23 p. (Condensed from *Stahl und Eisen*, v. 72, no. 12, 1952, p. 653-662; disc., p. 662.)

Survey of development, production, properties, and inspection of steels for large forgings, with special consideration of the latest (1952) German specifications for such steels. Diagrams, tables. 11 ref.

5172* Metallurgy. H. A. Holden. *Chemical & Process Engineering*, v. 34, Dec. 1953, p. 384-387.

Describes rare earth and boron alloy steels; methods of their corrosion protection, and cold working. Discusses Mg, Ti, Zr, Mo, V, and other rare metals. Photographs, table. 105 ref.

5173* Materials for Central Station Pumps. J. B. Godshall. *Corrosion*, v. 10, Jan. 1954, p. 21-24.

Corrosion-erosion in feed pumps has been substantially eliminated by changing to resistant materials, particularly steels containing 5% or more of Cr. Micrographs.

5174 The Melting Point of Titanium. T. H. Schofield and A. E. Bacon. *Institute of Metals, Journal*, v. 82, Dec. 1953, p. 167-169.

Melting point of Ti has been re-determined using a technique which reduces possibility of contamination by refractories. Tables. 10 ref.

5175 Making the Best of Metals. *Institute of Metals, Journal*, v. 82, 1953; *Institute of Metals, Bulletin*, v. 2, Dec. 1953, p. 28-53; disc., p. 53-55.

Symposium of Birmingham Local Section of Institute of Metals on Feb. 27, 1953. Includes "Non-Ferrous Metal Resources", R. Lewis Stubbs; "Some Elementary Thermodynamics of Refining", V. Kondic; "The Preparation of Refined Copper and Copper-Base Alloys From Metal Scrap", H. J. Miller; "Remelting and Refining of Aluminium Alloys", E. Scheuer; "The Aluminothermic Process and Its Variants", T. Burchell; "The Recovery of Copper and Zinc From Liquid and Gaseous Effluents", S. Hands; and "The Economical Use of Metals", W. L. Hall and E. C. Mantle. 41 ref.

5176 Scrap Preparation Program Improves Steel Quality. E. W. Hunziker. *Iron Age*, v. 172, Dec. 17, 1953, p. 132-136.

If purchased scrap is poorly prepared and segregated, quality and cost of steelmaking suffers. A positive program to improve scrap preparation combines efforts of dealers and consumers. Photographs, graphs.

5177 Handbook of Terms Commonly Used in the Nonferrous Industries. *Iron Age*, v. 173, Jan. 7, 1954, p. 343-344, 348, 351-354, 356-364, 366, 369-382.

Includes Al, Cu and brass, and Mg fields.

5178 Shapes of Floating Liquid Zones Between Solid Rods. P. H. Keck, M. Green, and M. L. Polk. *Journal of Applied Physics*, v. 24, Dec. 1953, p. 1479-1481.

Discusses theoretical and experimental determinations. Table, graph, diagrams. 5 ref.

5179 Tin Increases Strength of Ti-Al Alloys Without Loss in Fabricability. W. L. Finlay, R. I. Jaffee, R. W. Parcel, and R. C. Durstein. *Journal of Metals*, v. 6, Jan. 1954, p. 25-29.

Experimental data show 5% Al-2.5% Sn alloy is markedly superior to interstitial α type alloys. Graphs, tables. 3 ref.

5180* Vanadium-Properties, Occurrence, Benefication & Reduction. G. P. Mathur and P. I. A. Narayanan. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Nov. 1953, p. 510-514.

World production and occurrence are treated. 10 ref.

5181* Application of Thermodynamic Functions to Metallurgy. (Hungarian.) Aurel Horvath. *Kohaszati Lapok*, v. 8, no. 12, Dec. 1953, p. 245-258.

Describes first law of thermodynamics, molecular-kinetic and thermodynamic explication of heat capacity, law of equipartition of energy, and characteristics related to heat capacity of substances in different states of aggregation. Graphs, tables. (To be continued.)

5182 Aluminium Foil as a Thermal Insulator and as a Vapour Barrier. Joseph B. Singer. *Light Metals*, v. 16, Dec. 1953, p. 403-405.

Discusses properties and uses. Graph, tables, diagram. 7 ref.

5183* Technical Developments in 1953. Nathaniel Hall. *Metal Finishing*, v. 52, Jan. 1954, p. 52-61.

Progress in cleaning, pickling, polishing, metallic coatings, metallizing, testing, and control. 311 ref.

5184* Old and New Uses of Zinc. (German.) K. Bayer. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 838-842.

Various uses of Zn and Zn alloys are discussed. Photographs, tables. 11 ref.

5185* The Malleable Zinc Alloy ZnMn1Pb. (German.) J. Schramm. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 862-870.

Discusses composition, melting, casting, extruding, drawing, shaping, and forgings. Describes properties, effect of various metal additions, corrosion resistance, and prospective uses for the wrought alloy. Tables, graphs, diagrams, micrographs. 8 ref.

5186* Process of Producing Tin Solder and Antifriction Metals. (German.) H. Kiessler. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 870-872.

Specifications are presented. Tables. 2 ref.

5187 Developments in the Metallurgy of Tin and Its Alloys. J. W. Cuthbertson. *Metallurgia*, v. 48, no. 290, Dec 1953, p. 277-281.

Presents discussion of recent progress in tin-plate production; ternary and Al-Sn bearing alloys; and electrodeposition of Sn-Zn and Sn-Ni alloys. Photographs, micrographs, table. 12 ref.

5188 The Present Status of Magnesium and Its Alloys. R. G. Wilkinson. *Metallurgia*, v. 48, no. 290, Dec. 1953, p. 282-288.

Presents survey of recent developments with particular attention to casting alloys containing Zr and Th, which have greatly improved properties at elevated temperatures. Photographs, tables, graphs, micrographs. 13 ref.

5189 Copper and Copper Alloys. A Survey of Technical Progress During 1953. E. Voce. *Metallurgia*, v. 48, no. 290, Dec. 1953, p. 289-298.

Discusses material resources, extraction, fabrication, finishing, properties, applications, corrosion, welding, and powder metallurgy. 230 ref.

5190 The Processing, in the Higher Density Range, of Durable, Precision Iron Powder Parts on a Production Basis. William J. Doelker and Harold T. Harrison. *Metal Powder Association, Proceedings*, 1953, p. 22-46; disc., p. 47. (TN695 M56p)

Discusses important characteristics of powders, physical properties, dimensional tolerances of parts, and tool life. Graphs, diagrams, tables, micrographs.

5191 Norwegian Production of Stainless Steels. John Sissener. *Metal Progress*, v. 65, Jan. 1954, p. 81-83, 164, 166.

Describes facilities, methods, and products of two Norwegian plants. Includes discussion of foundry practice, alloy compositions, and mechanical properties. Photographs, table.

5192 British Advances in Metals, Fabrication Methods and Applications. Tom Bishop. *Metal Progress*, v. 65, Jan. 1954, p. 101-104, 188, 190.

Brief review of activities in 1953 including a new alloy steel; a new nickel alloy—"Nimonic 95"; corrosion of Cu and its alloys; development of a new series of Cu-Mn-Sn alloys; installation of an interplanetary rolling mill; studies of wire-drawing techniques; and development of cast milling cutters. Photographs, diagram, table.

5193 Postwar European Progress in Wrought Aluminum and Its Alloys. Paul Brenner. *Metal Progress*, v. 65, Jan. 1954, p. 112-115, 194, 196, 198, 200.

Reviews activities in scrap recovery, alloy development, machinability, joining, and applications. Photographs, table.

5194 Metallic Materials for a Steam Power Plant Operating at 1130°F. Herbert Buchholtz, Wilhelm Ruttmann, and Rudolf Schinn. *Metal Progress*, v. 65, Jan. 1954, p. 116-120, 180, 182, 184, 186, 188.

A complete report on construction steels used. Data is given on compositions, strength properties, provision for safety at high temperatures, intergranular disintegration, stress-corrosion, effect of combustion gases and steam, toughness, and welding problems. Photograph, table, graphs, micrograph.

5195* The Production and Uses of Beryllium. I-II. A. G. Thomson. *Mining Journal*, v. 241, Dec. 4, 1953, p. 661-662; Dec. 18, 1953, p. 724-725.

Part I discusses production sources and extraction processes. Part II covers properties, applications, availability, and supply.

5196* Metalworking in Making Closures for Containers. Walter Rudolph. *Modern Industrial Press*, v. 15, Dec. 1953, p. 13, 16, 18, 20.

Equipment and procedures for making caps and other closures. Photographs.

5197* Pressure Vessel Fabrication in New Plant. Kenneth L. Walker. *Modern Machine Shop*, v. 26, Jan. 1954, p. 136-144, 146.

Describes giant size tools for forming, machining, welding, and testing huge processing equipment. Photographs.

5198* Britain's Biggest Aluminum Fabricator. II. *Modern Metals*, v. 9, Dec. 1953, p. 35-36, 38, 40, 42, 44.

Facilities and operations of Northern Aluminum Co., England, include bar mills, wire-drawing equipment, rolling mills, and scrap reclaiming plant. Discusses British applications of Al in aircraft, automobiles, containers, and ships. Photographs.

5199* A Look Back at Light Metals in 1953. *Modern Metals*, v. 9, Dec. 1953, p. 72, 74-76, 78-85.

Discusses applications, forming, fabrication, powder metallurgy, coatings, brazing, smelting, and production trends. Photograph.

5200 You Can Use Aluminum Like Wood. Herb Pfister and Harry Walton. *Popular Science*, v. 163, Dec. 1953, p. 158-167.

A new use for Al is introduced. Photographs, diagrams.

Metallurgy

5201* Chemistry of Metal Alloys. (Russian.) I. I. Kornilov. *Priroda*, v. 42, no. 10, Oct. 1953, p. 16-23.

Discusses importance of Mendeleev periodic chart in predetermining nature of interaction between metals and metalloids. Tables, graphs, micrographs.

5202* New Techniques Tame Titanium. Robert Jaffee. *SAE Journal*, v. 62, Jan. 1954, p. 34-37.

Based on secretary's report of Panel on Titanium, Aeronautic Production Forum, SAE National Aeronautic Meeting, New York, April 20, 1953. Discusses production, applications, and properties of Ti.

5203 Metals for Reactor-Core Construction. Henry A. Saller. *Science*, v. 119, Jan. 1, 1954, p. 4-8.

Discusses problems of the materials engineer in reactor-core construction. Tables, graphs. 16 ref.

5204* Toxicity of Beryllium. Carl S. Pomelee. *Sewage and Industrial Wastes*, v. 25, Dec. 1953, p. 1424-1428.

Problems in handling of waste materials and their disposal.

5205 Steel's 1954 Forum on Technical Progress. *Steel*, v. 134, Jan. 4, 1954, 130 p.

Consists of brief remarks by 321 executives of metal-working plants on steelmaking; nonferrous metal production; casting; materials and metallurgy; heat treating; inspection and testing; drives and controls; machining, tooling and gaging; forming; cleaning and finishing; joining and assembly; handling and packaging; lubrication; and service and maintenance.

5206* Dealer Program for Purchased Scrap Improves Quality, Rate of Production at USS Plant. E. W. Hunziker. *Western Metals*, v. 11, Dec. 1953, p. 65-68.

Discusses scrap preparation and effect of scrap characteristics on quality and rate of production of finished steel. Photographs, graph.

Books and Miscellaneous Publications

5207 ASTM Specifications for Steel Piping Materials. ASTM Committee A-1 on Steel. 383 p. Dec. 1952. American Society for Testing Materials, Philadelphia 3, Pa. (TA492.P6 Am35sp)

5208 (Iron and Steel Handbook.) **Werkstoff-Handbuch Stahl und Eisen.** Karl Daeves, editor. 3rd Rev. Ed. 748 p. 1953. Verlag Stahleisen M.B.H., Düsseldorf, Germany. (TN705 V58w3)

Comprehensive presentation of technology in iron and steel, compiled by outstanding German experts in the field. Discusses properties and their testing; composition and production of special types of iron and steel; steels for special applications; treatment of steel; and testing methods. In ringbook form, the publisher supplies supplements to keep the publication up to date.

5209 Metallurgical Dictionary. J. G. Henderson and J. M. Bates. 396 p. 1953. Reinhold Publishing Corp., New York. (PE1683 H38m)

Assembles in a concise, orderly, and comprehensive manner, definitions of those terms considered essential to both the professional and the layman in understanding metallurgical literature.

5210 Procedures in Experimental Metallurgy. A. U. Seybolt and J. E. Burke. 340 p. 1953. John Wiley & Sons, Inc., New York. (TN665 Se93e)

Describes most of the important laboratory techniques which are now used in preparation of metals and alloy specimens for further study.

See also:
4728 (applications of high Si cast iron)
4736 (Ti processing)
4740 (application of Zn)
4741 (application of Zn)
4825 (use of Pb in storage batteries)
5085 (application of steel)
5237 (production of Pb from scrap)

METALS—EXTRACTION AND REFINING

5211* Observations on the Continuous Casting of Light Metal Billets. (German.) K. E. Mann. *Aluminium*, v. 29, no. 12, Dec. 1953, p. 497-508.

Discusses faults occuring during continuous casting of Al and Mg alloys. Summarizes mechanical properties of alloys prepared by continuous casting. Micrographs, photographs, tables.

5212* Practical Aspects of the Thermodynamics of Magnesium Oxide Reduction. (Hungarian.) Andor Szulyovszky. *Aluminium (Budapest)*, v. 5, no. 9, Sept. 1953, p. 185-196.

Thermodynamic data of Mg reduction as basis for work necessary in starting a Hungarian Mg industry. Tables, graphs. 14 ref.

5213 Regenerator Efficiency and Air Preheat in the Open Hearth. B. M. Larsen. *American Iron and Steel Institute, Preprint*, Oct. 21, 1953, 50 p. (TS300 Am35ta)

Paper presented at Birmingham Regional Technical Meeting of AISI, Oct. 21, 1953. Data are based on tests for regenerator efficiency made on three operating open-hearth furnaces which represent about the extreme of present operating practices. Diagrams, tables, graphs.

5214 Coming Changes in Iron and Steel. Clarence E. Sims. *Battelle Technical Review*, v. 3, Jan. 1954, p. 7-8.

Iron and steel industry will lean heavily on technology to insure receipt by the Nation of greater quantities of Fe and steel at low cost.

5215* Purifying Industrial Zinc Sulfate Solutions by Cementation. (German.) H. Enzfelder. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, no. 11, Nov. 1953, p. 227-234.

Electrolytic methods were used to extract Zn from the ore. Describes procedure for precipitating disturbing elements from $ZnSO_4$ solutions. Tables, graphs. 35 ref.

5216 Relining and Enlarging No. 9 Blast Furnace at Appleby-Frodingham. G. D. Elliot, A. Bridge, E. Jarvis, and T. E. Mitchell. *Blast Furnace and Steel Plant*, v. 42, Jan. 1954, p. 52-56.

A daily account of relining and enlarging of a blast furnace.

5217 Report on West Coast Steel Plants, 1953. Thomas A. Dickinson. *Blast Furnace and Steel Plant*, v. 42, Jan. 1954, p. 62-66, 69.

Includes photographs.

5218 Design and Manufacture of Ingot Molds. John H. Shank. *Blast Furnace and Steel Plant*, v. 42, Jan. 1954, p. 70-72.

Design of molds at the Colorado Fuel and Iron Corporation, and experiences in arriving at a design to fulfill overall requirements of the several end products. Diagrams.

5219 Electrical Developments in 1953. W. E. Miller. *Blast Furnace and Steel Plant*, v. 42, Jan. 1954, p. 73-82.

Includes developments in steel making; blooming and slabbing mills; hot strip mills; rod and skelp mills, tandem cold strip molds; and single stand cold reduction mills. Graphs, photographs, diagrams.

5220* Basic Hearth Construction and Maintenance. G. Reginald Bashforth. *British Steelmaker*, v. 19, Dec. 1953, p. 704-711.

Discusses causes of hearth failure, tap hole construction, shape of hearth, and fettling practices. Graph, photograph. 4 ref.

5221 Study of Slags With High Titanium Content. W. Freundlich. *Henry Brutcher, Altadena, Cal., Translation no.* 3005, 27 p. (From *Bulletin de la société chimique de France*, 1952, May-June, p. 655-663.)

Discusses conditions for maximum yield of Ti. Tables, graphs, micrographs. 3 ref.

5222 Plant, Operation, and Economics of Oxygen (Converter) Steelworks. K. Rösner. *Henry Brutcher, Altadena, Cal., Translation* no. 3006, 16 p. (Condensed from *Stahl und Eisen*, v. 72, no. 17, 1952, p. 997-1004.)

Outline of LD process where oxygen is introduced from the

top into basic-lined converters having no tuyeres in their bottom. Graphs, diagrams. 3 ref.

5223 Stringers in Stainless Steel. O. Krifka. *Henry Brutcher, Altadena, Cal., Translation no.* 3059, 12 p. (From *Stahl und Eisen,* v. 72, no. 1, 1952, p. 39-42.)

Practical study of best ways of minimizing harmful non-metallic inclusions (macro- and micro-slags) in stainless steel, specifically 18% Cr steel. Micrographs. 10 ref.

5224 Viscosity Measurements of Synthetic Slags in FeO-SiO_2-TiO_2 System. G. Urbain. *Henry Brutcher, Altadena, Cal., Translation no.* 3068, 4 p. (From *Comptes rendus,* v. 232, p. 330-332.)

Discusses viscosity determinations in Armco-iron crucible by principle of damped oscillations. Diagram, graphs. 4 ref.

5225 Quantitative Study of Extraction of Titanium Dioxide From Ilmenite by Smelting. I. W. Freundlich. *Henry Brutcher, Altadena, Cal., Translation no.* 3119, 25 p. (From *Bulletin de la société chimique de France,* v. 19, no. 5, 1952, p. 490-496.)

Detailed investigation of a German-developed process of extracting TiO_2 from ilmenite by heating a mixture of 100 parts of ilmenite, 20 parts of 50% NaOH, and 20 to 25 parts of wood charcoal to 2400 to 2550 F in a rotary drum furnace, where a TiO_2-rich (60 to 70%) liquid slag separates from liquid metal phase containing all the iron. 14 ref.

5226 Loss of Alloying Elements of Steel During Oxygen Refining in the Basic Arc Furnace. I. E. Pachaly, *Henry Brutcher, Altadena, Cal., Translation no.* 3146, 14 p. (From *Stahl und Eisen,* v. 73, no. 8, Apr. 8, 1953, p. 461-469.)

Previously abstracted from original. See item no. 10740, v. 2, Oct. 1953.

5227 Loss of Alloying Elements of Steel During Oxygen Refining in the Basic Arc Furnace. II. E. Pachaly. *Henry Brutcher, Altadena, Cal., Translation no.* 3147, 19 p. (From *Stahl und Eisen,* v. 73, no. 8, 1953, p. 465-469.)

Successful remelting of chrome-manganese stainless scrap with use of oxygen in the basic arc furnace. Data on Mg recovery. Graphs, tables. 9 ref.

5228* Kinetics of the Low-Temperature Reduction of Iron Ores. Reduction of Artificial and Natural Iron Ores by Hydrogen. (Russian.) S. T. Rostovtsev and A. P. Em. *Doklady Akademii Nauk SSSR,* v. 93, no. 2, Nov. 11, 1953, p. 329-332.

Investigation of rich Krivoi Rog ore. No essential difference was noted in the reduction kinetics between Krivoi Rog ore and chemically pure FeO. Graphs.

5229 Australian Metallurgist Reports on African Smelting Progress. L. A. Lyons. *Engineering and Mining Journal,* v. 155, Jan. 1954, p. 96-100.

Briefly outlines types of ores treated, equipment, and processes. Tables, photographs.

5230 Flotation. Robert B. Booth. *Industrial and Engineering Chemistry,* v. 46, Jan. 1954, p. 105-111.

Discusses developments in sulfide and oxide metallic ores and non-metallics including coal. 81 ref.

5231 Production of Carbon Steel in Large Basic Electric Furnaces. R. J. Tremblay. *Industrial Heating,* v. 20, Dec. 1953, p. 2425-2426, 2428, 2430, 2432.

Describes manufacture of ingots by single slag method in furnaces charged with 100% scrap.

5232 Iron Ores. A. Grieve. *Iron & Steel,* v. 26, Dec. 11, 1953, p. 617-620; disc., p. 663-666.

Paper from Symposium on Sintering, following Iron and Steel Inst., Autumn General Meeting, 1953. Results of experimental studies of softening at high temperatures. Tables, graphs.

5233 Activities of Constituents of Iron and Steelmaking Slags. II. Manganous Oxide. III. Phosphorus Pentoxide. E. T. Turkdogan and J. Pearson. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 393-398.

Equilibrium constant of Mn reaction has been calculated and used, in conjunction with ferrous oxide activity diagram from part I, to evaluate activity of manganous oxide in MnO-FeO-SiO_2 and some basic steelmaking slags. Graphs, diagrams. 12 ref.

5234 Belt-Charged Blast-Furnaces of S. A. John Cockerill, Belgium. G. Hookham. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 409-419.

After briefly reviewing reasons for adopting a belt system, installation is described. It is shown how many new problems encountered in design and practical operation were solved. Diagrams, photographs.

5235* Processing Zinc Dust and Dross in the Directly Heated Revolving-Drum Furnace. (German.) G. Lorber. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 861.

Efficient method of extracting Zn. Photographs, table.

5236* The Residual Zinc in the Distillation of Al-Zn Alloys. (German.) H. Schunck. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 875-876.

Factual data on vapor pressures of Zn at different composition and temperatures are presented. Graphs, tables.

5237* The Production of Lead From Ores, Residues, and Scrap. (German.) P. O. Poettken. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 886-892.

Describes beneficiation, roasting, and smelting of ores, refining of crude metal, and old and new methods of extracting Ag. Diagrams, photographs. 5 ref.

5238 Advanced Practices in Italy. Alberto Oreffice. *Metal Progress,* v. 65, Jan. 1954, p. 84-88, 136.

General description of equipment and methods employed by Fabbrica Italiana Automobili Torino, which manufactures Fiat motor cars. Includes electric iron smelting, electric steel production, control and research laboratory procedures, and malleable foundry practice. Diagrams, photographs, table.

5239 Evolution of the Thomas (Basic Bessemer) Steelmaking Process in Europe. G. Husson. *Metal Progress,* v. 65, Jan. 1954, p. 94-96, 168, 170, 172, 174, 176.

Describes improvements in controlling the basic bessemer blow, determination of end point, and control of S, P, and N. Discusses benefits achieved with O enriched blast. Photograph. 10 ref.

5240 New Manufacturing Processes for High-Grade Steel in Sweden. Bo Kalling. *Metal Progress,* v. 65, Jan. 1954, p. 108-111, 200, 202.

Brief review of trends in pig iron and steel tonnages. Discusses new developments in production of pig iron, sponge iron, and steelmaking. Photographs, graphs.

5241* Effect of Gangue Size on Flotation. George W. Mao. *Mines Magazine,* v. 43, Dec. 1953, p. 23-26, 28, 42.

Discusses effects of particle size on flotation and hypotheses of slime-coating mechanism. Tables, graphs. 11 ref.

5242 Starches and Starch Products as Depressants in Amine Flotation of Iron Ore. C. S. Chang, S. R. B. Cooke, and R. O. Huch. *Mining Engineering,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 196, Dec. 1953, p. 1282-1286.

Includes graphs, tables, photograph. 7 ref.

5243* Copper-Base Continuous Castings. *Precision Metal Molding,* v. 12, Jan. 1954, p. 44-45, 48.

New method of casting with advantages and uses of its products. Photographs, table.

5244* The Movement of Steel in the Converter. (German.) Fritz Schultz-Grunow. *Stahl und Eisen,* v. 73, no. 20, Sept. 24, 1953, p. 1282-1284.

Experiments conducted in a Plexiglas model. Photographs, diagrams.

5245* Mechanism of Over-Voltage Formation on the Carbon Anode in Cryolite-Alumina Fusions. (Russian.) S. I. Rempel and L. P. Khodak. *Zhurnal Prikladnoi Khimii,* v. 26, no. 9, Sept. 1953, p. 931-940.

Discusses origin of high anode voltage during electrolytic refining of Al. Diagram, graphs. 16 ref.

Metals—Extraction and Refining

See also:
4493 (leaching of metal ores)
4992 (gas in production of light metals)
4996 (combustion in the blast furnace)
5475 (refining of Mg-Ti alloy)
5700 (blast furnace dust removal)

METALS—FINISHING, POLISHING, AND CLEANING

5246* Cut Finishing Time 2/3 on 120-mm. Powder Chambers. Anderson Ashburn. *American Machinist*, v. 97, Dec. 21, 1953, p. 100-101.

Tracer-controlled grinders have been taking over internal finishing of gun-tube powder chambers a size at a time. Photographs, diagrams.

5247* A Simple Reproducible Method for Determining Metal Cleaning Efficiency. Arnold Miller and Edward A. Hedman. *ASTM Bulletin*, 1953, no. 194, p. 51-52.

Describes simple test procedure for screening metal cleaners, which can be used for determining optimum cleaning cycles for horological components. Photographs.

5248 Chemical Polishing of Iron and Soft Steel. L. Beaujard. *Henry Brutcher, Altadena, Cal., Translation no.* 3051, 3 p. (From *Comptes rendus hebdom. des Séances de l'Académie des Sciences* (Paris), v. 234, 1952, p. 440-442.)

Brief report on a solution suitable for chemical polishing of pure iron and steels with less than 0.05% C, which gives results on a par with those of electrolytic pickling. Diagram, photomicrograph.

5249 Non-Electrolytic Smoothing Treatment for Steel. W. A. Marshall. *Electrodepositors' Technical Society, Journal*, v. 28, 1951-1952, p. 27-45; disc., p. 61-68 + 7 plates.

Part I describes work carried out to investigate conditions under which smoothing action takes place, together with results of some preliminary quantitative determinations of type and degree of smoothing achieved. Part II describes qualitative and quantitative investigations of adhesion obtained between smoothed and electrodeposited nickel. Tables, graphs, diagram. 4 ref.

5250 The Physical and Chemical Changes Which Accompany the Polishing of Metals. A. J. W. Moore, *Electrodepositors' Technical Society, Journal*, v. 28, 1951-1952, p. 117-124; p. 125-131 + 6 plates.

Illustrates relationship between phenomena of friction and properties of a polished surface. 21 ref.

5251 Titanium Descaled Successfully With Sodium Hydride. Marshall Sittig. *Iron Age*, v. 172, Dec. 17, 1953, p. 137-139.

Even in sheets as thin as 0.015 in., bath works successfully without burn-through if temperatures are carefully controlled. Photographs, diagrams.

5252 Versatile Setups Finish Diecastings Faster. Frank E. Beers. *Iron Age*, v. 172, Dec. 24, 1953, p. 73-75.

Economy and efficiency result from close supervision and quality control. Photographs.

5253 Finishing Systems for Magnesium. Hugo A. Barbian. *Materials & Methods*, v. 39, Jan. 1954, p. 102-105.

Explores requirements for finishing Mg; finishing systems currently used and their service experience; and new developments for finishing Mg. Photographs, diagrams, tables.

5254 Mutual Polishing of Different Crystals. V. D. Kuznetsov. *National Science Foundation Translation, no.* 51, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, no. 2, Mar. 11, 1953, p. 271-274.)

Previously abstracted. See item no. 835, v. 3, Jan. 1954.

5255* Modern Cleaning of Castings. (Hungarian.) György Szvath. *Öntöde*, v. 4, no. 9, Sept., p. 202-204.

Describes modern processes and machinery with special emphasis on elimination of dust and proper airing of the shop. (To be continued.)

5256 Precision Barrel Finishing. Malcolm M. Maynes. *Plating*, v. 41, Jan. 1954, p. 55-60.

Discusses equipment, operating procedures, and applications. Photographs.

5257* Barrel Finishing of Metal Products. The Use of a Slurry in Barrel Finishing. H. Leroy Beaver. *Products Finishing*, v. 18, Jan. 1954, p. 24-26, 28, 30, 32, 34.

Defines slurry and presents its use in finishing procedures.

5258* Liquid-Abrasive Working of Metals. (Russian.) K. P. Kochetov. *Stanki i Instrument*, v. 24, no. 10, Oct. 1953, p. 19-23.

Method of cleaning castings, forgings, and rolled products increases corrosion resistance. Tables, diagrams, photograph.

5259* Finishing Intricate Castings. Russel H. Bennett. *Western Machinery and Steel World*, v. 44, Dec. 1953, p. 87-88.

Engineering has played a big factor in design of fixtures for machining of intricate Al castings at Hoover Electric Co. Photographs.

5260* A New Style De-Scaling Machine. *Wire and Wire Products*, v. 28, Dec. 1953, p. 1315-1316. (Translated and abridged from *Draht*, March 1953.)

Presents description of equipment and operating characteristics. Photographs.

See also:
5291 (modern cleaning of castings)

METALS—FOUNDRY PRACTICE

5261 Blow-In Core Driers Used for Close Tolerances. *American Foundryman*, v. 25, Jan. 1954, p. 40-43.

By combining two established molding methods in one casting operation, Al core driers can be produced with such smooth finish as to minimize machining and tooling in cavities. Process uses conventional green sand molding for cope and cheek, permanent mold for drag. Photographs.

5262 Foundry Facts. Chill Testing of Cast Iron. *American Foundryman*, v. 25, Jan. 1954, p. 65-66.

Presents data sheet for wedge and chill test procedures. Diagrams, table.

5263* Electric Furnaces for the Iron Foundry. (Dutch.) *Bedrijf en Techniek*, v. 8, no. 190(25), Dec. 1953, p. 540-541.

Use and energy consumption of various electric melting and heat-treating furnaces are discussed. Photographs.

5264* Carbon Equivalent and Fluidity. E. R. Evans. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Dec. 1953, p. 118-123.

Fluidity of hypo-eutectic cast irons at any temperature increases with carbon equivalent until a critical value is reached. Graphs, tables. 7 ref.

5265 Determination of Fluidity of Metals in Casting by Means of a Spiral Shell Mold. P. Schneider. *Henry Brutcher, Altadena, Cal., Translation no.* 3049, 6 p. (From *Giesserei, Technisch-Wissenschaftliche Beihefte*, 1952, nos. 6-8, p. 379-381.)

Brief review of methods currently in use and their drawbacks. Photographs, diagrams, graph. 5 ref.

5266* Continuous Flow From Casting Through Shipping. *Flow*, v. 9, Jan. 1954, p. 82-85.

A single building with foundry and machine operations, quality control, packaging, and shipping are all integrated into one big process. Diagram, photographs.

5267 Modern Swiss Foundry Incorporates Automatic Controls. Victor Frey. *Foundry*, v. 82, Jan. 1954, p. 104-109.

Describes equipment, plant layout, and operating procedures. Diagram, photographs.

5268 All-Electric Operation Features Modern Permanent Magnet Foundry. Robert H. Herrmann. *Foundry*, v. 82, Jan. 1954, p. 86-91, 206, 208, 210, 212.

Describes equipment, plant layout, and operating procedures. Diagram, photographs, tables.

5269 Sand Castings Can Be Made to Close Tolerances. Lewis B. Reed. *Foundry*, v. 82, Jan. 1954, p. 92-97, 235-236.

Reports production of intricate Al and Mg parts with high degree of dimensional accuracy. Photographs.

5270 Several Factors Influence Linear Shrinkage. Hubert Chappie. *Foundry*, v. 82, Jan. 1954, p. 100-103.

Various factors prevent establishment of fixed rule to cover shrinkage of other than small light parts. Photographs.

5271 A B C of Foundry Practice. II. Core Blowing Equipment and Use. Pat Dwyer. *Foundry*, v. 82, Jan. 1954, p. 168, 171.

Presents discussion of principles and techniques of process by two manufacturers. Diagrams.

5272 Foundry Data Sheet. Formulas for Determining Weights of Castings. *Foundry*, v. 82, Jan. 1954, p. 173-174.

Presents data sheet for determining weights of castings. (To be continued.)

5273 Experiences in the Exothermic Feeding of Grey-Iron Castings. J. Grice. *Foundry Trade Journal*, v. 95, Dec. 17, 1953, p. 749-757; disc., p. 757-758.

Discusses developments and techniques which contribute to more economical, high quality castings. Photographs, diagrams.

5274 Application of Shell Moulding to Steel Castings. C. Hand and P. R. Beeley. *Foundry Trade Journal*, v. 95, Dec. 17, 1953, p. 745-747, 759.

Discussion by actual producers concerning capabilities of process. Photographs.

5275 Experiences in Degassing Aluminium Alloys. D. P. Sparham and E. A. Moult. *Foundry Trade Journal*, v. 95, Dec. 24, 1953, p. 777-781.

Discusses early casting practices and degassing methods. Describes establishment of present practice and results obtained with new technique. Photographs, table.

5276 Practical Experience of Shell Moulding. C. Potter. *Foundry Trade Journal*, v. 95, Dec. 24, 1953, p. 783-785.

Extract from paper read before West Riding of Yorkshire branch of Inst. of British Foundrymen. Includes photograph.

5277 Plaster Moulded Aluminium Patterns. *Light Metals*, v. 16, Dec. 1953, p. 396-397.

Discusses advantages of plaster molding and production of patterns. Photographs.

5278* New Tendencies in the Construction of Pouring Systems for Casting Under Pressure. (Russian.) V. M. Pliatskii. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 5-8.

Suggestions are offered for obtaining castings with well defined edges, precise contours, and a minimum of porosity caused by air. Photographs, diagrams.

5279* Rational Cycle of the Impact Molding Machine. (Russian.) L. A. Izrailevich. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 9-11.

Theoretical presentation. Graphs. 4 ref.

5280* Test in the Application of Water Glass in Production of Foundry Molds. (Russian.) P. I. Shportenko. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 17-18.

Application resulted in clean, strong molds. Tables.

5281* Chill Casting of Large Parts From Al-2 Alloy. (Russian.) K. N. Osminkin and B. D. Krifuks. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 19-20.

Describes a production model of a chill mold with a flexible metallic core securing free shrinkage in large castings. Photographs, diagrams.

5282* Six-Spindle Centrifugal Machine for Casting Bronze Bushings. (Russian.) D. M. Krymskii and N. I. Mishchenko. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 27-28.

Machine decreased rejects 2 to 3% and increased yearly output. Table, diagrams.

5283 Quality Control Applied to Die Casting. H. R. Haag. *Machinery (London)*. v. 83, Dec. 25, 1953, p. 1263-1268.

States advantages of checking samples and necessity of proper test equipment. Table, micrographs, photographs.

5284 Designing Die Casting Dies for High-Speed Operation. H. K. Barton. *Machinery (London)*, v. 83, Dec. 25, 1953, p. 1268-1276.

Consideration of die temperature ranges for satisfactory casting. Graph, charts, diagrams.

5285 Type Founding. *Metal Industry*, v. 83, Dec. 4, p. 457-459; Dec. 11, 1953, p. 477-480.

Describes equipment, procedure, and techniques involved in this process of non-ferrous castings. Discusses gages, molds, and techniques of molding. Photographs.

5286 Foundry Briefs: Sub-Cutaneous Porosity. *Metal Industry*, v. 83, Dec. 25, 1953, p. 525-526.

Discusses factors influencing porosity in leaded-nickel-bronze. Two alloys having similar though slightly different characteristics will not necessarily respond identically to same founding conditions. Photograph, micrographs.

5287* Zinc Alloys as Casting Materials. (German.) G. Lieby. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 856-860.

Discusses properties of Zn alloys and common methods of casting. Describes practical application of Zn pressure casting. Tables, diagrams, photographs.

5288* Metal Casting Methods. IX. Cleaning and Fettling Practice. J. B. McIntyre. *Metallurgia*, v. 48, no. 290, Dec. 1953, p. 273-276.

Operations necessary, after casting has been removed from mold to prepare it for shipment to customer, are discussed. Photographs, table.

5289* Theory and Practical Application of High-Speed Casting. (Hungarian.) Miklos Csizar. *Öntöde*, v. 4, no. 9, Sept., p. 189-196.

Describes a new high-speed casting method based on filling the mold fast enough that temperature is nearly equal in all parts of the mold. Air and gas conduction is modified in a manner that prevents gases from getting into the mold. Details of the process are described. Graphs, tables, diagrams.

5290* The Basic Cupola. (Hungarian.) Ferenc Varga. *Öntöde*, v. 4, no. 10, Oct. 1953, p. 205-213.

Describes different methods of desulfurization processes and development of basic lined cupola. Operation and costs are discussed. Tables, graphs, diagrams. 20 ref.

5291* Modern Cleaning of Castings. II. (Hungarian.) György Szvath. *Öntöde*, v. 4, no. 10, Oct. 1953, p. 216-218.

Discusses dust collector installations in foundries and on polishing machines. Diagrams.

5292* Copper Alloy Test Bar Cast in Sand. (Hungarian.) Sándor Polgáry. *Öntöde*, v. 4, no. 12, Dec. 1953, p. 248-249.

Proposes a new method for casting test bars of special Cu alloys. Results of method are discussed. Tables, diagrams.

5293* Improving the Quality of Castings by Decreasing the Extent of Burning on of Mold Parts. (Hungarian.) András Tóth. *Öntöde*, v. 4, no. 12, Dec. 1953, p. 254-257.

Discusses significance of refractoriness of foundry sands and of their grain size. Practical suggestions for cleaning castings and testing composition of sands as well as determining grain size are given.

5294* Preparation and Casting of Metals and Alloys Under High Vacuum. J. D. Fast, A. I. Luteijn, and E. Overbosch. *Philips Technical Review*, v. 15, Oct. 1953, p. 114-121.

Method whereby metals and alloys of extreme purity and precise composition can be produced in a form that lends

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itself well to further shaping into test specimens or components. Photomicrographs, photographs, diagram, table, graph. 8 ref.

5295* Modern Casting Techniques. H. J. Meerkamp van Embden. *Philips Technical Review*, v. 15, Nov. 1953, p. 133-146.

Presents survey of development of metal casting. Describes sand, permanent metal mold, Croning, and lost-wax processes. Diagrams, photographs. 9 ref.

5296* Metallic Sealing Compounds Can Be Used for Production Impregnation. *Precision Metal Molding*, v. 12, Jan. 1954, p. 59-60, 72-74.

Gives typical examples and results that have been achieved. Photographs.

See also:
4992 (gas in foundries)
5238 (Italian foundry practice)
5255 (cleaning of castings)
5362 (formation of hot cracks in casting)
5381 (testing of Fe castings)
5423 (precision casting of turbine blades)
5475 (casting of Mg-Ti alloy)
5560 (quality control in foundry)
5580 (application of statistical methods in foundry production)
5794 (welding of die castings)

METALS—HEAT TREATMENT

5297 The Annealing of Copper After Radiation Damage at Low Temperatures. (English.) R. R. Eggleston. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 679-683.

Up to 80 C, rate of annealing was similar, but at room temperature about 25% of radiation damage remained, compared to 50% remaining in the cold-worked specimen. Graphs, table, diagram. 8 ref.

5298 Thermal Annealing of Radiation-Induced Hardness Changes in Alkali Halides. (English.) D. R. Westervelt. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 755-758.

Hardness changes, occurring under conditions where a large number of displacements may be expected, differ markedly in their thermal annealing characteristics from those where damage is largely due to ionization. Graphs. 5 ref.

5299 Carbo-Nitriding. *Automobile Engineer*, v. 43, Dec. 1953, p. 550-552.

A new Birlec controlled-atmosphere furnace for light-case work. Photographs, diagrams.

5300* Heating With High-Frequency Energy. (Dutch.) A. de Vries. *Bedrijf en Techniek*, v. 8, no. 189(24); *Electronica section*, v. 6, no. 136, Nov. 21, 1953, p. 185-187.

Brief discussion on heating of metals by high-frequency induction method. Diagrams.

5301* Dielectric Heating. (Dutch.) A. de Vries. *Bedrijf en Techniek*, v. 8, no. 190(25); *Electronica section*, v. 6, no. 137, Dec. 5, 1953, p. 193-195.

Principle and use of high-frequency resistance heating are briefly discussed. Photographs, graphs.

5302 Investigations on Annealing of Steels From Hot-Working Temperature With Isothermal Transformation. E. Theis. *Henry Brutcher, Altadena, Cal., Translation* no. 3032, 17 p. (Condensed from *Stahl und Eisen*, v. 71, no. 26, 1951, p. 1433-1438; disc., p. 1438-1440.)

Studies were made of transformation behavior for various final rolling and holding temperatures in a soaking furnace for holding times of up to 18 hours based on hardness tests and microexamination. Table, graphs, micrographs. 7 ref.

5303 Nitriding of Austenitic Steels. K. S. Khomenko. *Henry Brutcher, Altadena, Cal., Translation* no. 3047, 7 p. (From *Vestnik Mashinostroeniya*, v. 32, no. 3, 1952, p. 71-72.)

Describes difficulties encountered in nitriding of austenitic steels and ways in which they may be overcome.

5304 Annealing and Tempering of Steel Bars in an Induction Heat Treating Plant on Line Frequency. H. Krainer, M. Kroneis, and F. Raidl. *Henry Brutcher, Altadena, Cal., Translation no.* 3038, 13 p. (From *Stahl und Eisen*, v. 71, no. 17, 1951, p. 880-886.)

Extensive studies of induction annealing and tempering of steel bars, ¾ to 2¾" diameter, expecially 1⅝" diameter, in a 300 kw. unit operating on line frequency. Graphs, tables.

5305 On the Hardening of Steel, With Special Reference to Transformation Kinetics. F. Wever. *Henry Brutcher, Altadena, Cal., Translation no.* 3059, 19 p. (Condensed from *Stahl und Eisen*, v. 69, no. 19, 1949, p. 664-670.)

Reviews researches conducted at Kaiser-Wilhelm Institut from 1930 to 1948 into transformation kinetics of steel. Possibilities of applying results of these researches to practical heat treating are discussed. Graphs. 32 ref.

5306 Investigations Into the Spheroidizing of Plain Carbon and Low Alloy Steels. S. Ammareller. *Henry Brutcher, Altadena, Cal., Translation no.* 3083, 20 p. (From *Stahl und Eisen*, v. 70, no. 11, 1950, p. 459-463.)

A survey is made of processes for spheroidize annealing of structural and tool steels to obtain good machinability and a suitable structure for subsequent hardening. Graphs. 4 ref.

5307* Machines for the Induction Hardening of Surfaces. (German.) E. Höhne. *Elektrotechnische Zeitschrift*, v. 5, Ausgabe B, no. 11, Nov. 21, 1953, p. 359-363.

Principle of process and machines operated with average and high frequency current are described. Graph, photographs, diagram. 4 ref.

5308 Continuous Carburizing and Hardening of Pinions and Gears at Ford. *Industrial Heating*, v. 20, Dec. 1953, p. 2370-2372, 2374-2376, 2378.

Describes continuous furnace and quenching, annealing, and stress relieving operations. Photographs.

5309 An Evaluation of the Hardening Power of Quenching Media for Steel. III. Earl J. Eckel, Ross M. Mayfield, Glen W. Wensch, and Frank A. Rough. *Industrial Heating*, v. 20, Dec. 1953, p. 2392, 2394, 2396, 2398, 2518.

Results are given for an adaptation of end-quench test to still quenching conditions using oil and brine. Photograph, diagrams, graphs.

5310 Continuous Heat Treatment of Non-Ferrous Strip by Transverse Flux Induction Heating. I. Robert M. Baker. *Industrial Heating*, v. 20, Dec. 1953, p. 2402, 2404, 2406, 2408, 2410, 2412.

Describes method and its advantages over longitudinal flux heating. Diagrams. (To be continued.)

5311 How to Determine Quenching-Distortion Properties. J. E. Campbell and H. O. McIntire. *Iron Age*, v. 172, Dec. 17, 1953, p. 140-143.

Favorable stresses improve fatigue life. The greater the stresses the more the distortion. Water quenching produces higher stresses and more warpage than oil. Minimum distortion is obtained on steels with just enough hardenability to harden through. Graphs, diagram, tables, photograph.

5312 Nitriding Produces Better Hard Case on Titanium. J. L. Wyatt and N. J. Grant. *Iron Age*, v. 173, Jan. 14, 1954, p. 112-115.

Nitride hardening with ammonia will improve wear and antigalling properties. Graphs, micrographs, table.

5313* Surface Tempering Caused by Grinding. Gordon Murphy. *Machinery*, v. 60, Jan. 1954, p. 202-203.

Taken from paper presented before Fall Meeting of American Gear Manufacturers Association. Solving surface temper problem ended grinding cracks, through elimination of instantaneous heating, accompanied by rapid expansion and contraction.

5314* Hardenability of Steel. (Dutch.) F. Van Wijk. *Metalen*, v. 8, no. 22, Nov. 30, 1953, p. 401-406.

A concise survey is presented on theory of depth of hardening of steel. Discusses hardenability, severity of quench, and dimensions of quenched piece as factors controlling depth of hardening. Graphs, tables, photograph. 6 ref.

5315 Sulphurized Surfaces Resist Wear and Seizure. Bernard Jousset. *Metal Progress*, v. 65, Jan. 1954, p. 76-80.

Describes production of superior wear resistance on cast iron and steel engine parts by a heat treatment which adds a considerable amount of sulfur to the surface. Graphs, diagram.

5316 Developments in German Constructional Steels to Conserve Scarce Alloys. F. W. Bruhl. *Metal Progress*, v. 65, Jan. 1954, p. 97-100.

Discusses hardenability and machinability of carburizing and heat treating steels. Includes data on Ni-Cr, Cr-Mn, and triple-alloy steels. Graphs, diagram, table.

5317 Heat Treatment of Aluminum Casting Alloys. H. J. Rowe and W. E. Sicha. *Metal Treating*, v. 4, Nov.-Dec. 1953, p. 2-5, 34, 37.

Discusses furnaces, temperature control, annealing, precipitation hardening, and aging. Micrographs, tables, graphs. 9 ref.

5318* Machined Parts and Their Dimensional Control in Heat Treatment. I. Howard Boyer. *Modern Machine Shop*, v. 26, Jan. 1954, p. 120-129.

Methods of minimizing distortion and volume changes in steel are discussed. Sketches, micrographs. (To be concluded.)

5319* Annealing in a Gaseous Atmosphere. II. (Hungarian.) Elek Chapó. *Öntöde*, v. 4, no. 9, Sept., p. 185-189.

Describes structure and operation of annealing furnaces. Advantages of annealing in a gaseous atmosphere are reviewed. Diagrams, table. 9 ref.

5320 Inside Look at Hardening Cast Iron. John Obrebski. *Steel*, v. 133, Dec. 28, 1953, p. 71-73.

Hardenability of cast iron depends on analysis, structure, and as-cast hardness plus stability of pearlite. For high quality, watch these and the heat-treat process. Micrographs, photograph.

5321* Surface Hardening of Steel. (Norwegian.) Sigge Hähnel. *Teknisk Ukebald*, v. 100, no. 45, Dec. 3, 1953, p. 970-975.

Surveys methods of surface hardening.

5322* Carburizing of Steel by Natural Gas. (Russian.) G. I. Pogodin-Alekseev and G. V. Zemskov. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 65-68.

Discusses composition of the gas and carburizing temperature. Graphs. 3 ref.

5323* Influence of Chromium and Manganese Concentration in the Metallic Phase on the Annealing Ability of Tool Steel. (Russian.) V. V. Polovnikov. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 68-70.

Specimens of 24 melts were tested. Table, graphs.

5324* Means of Obtaining Deep Low-Temperature Gas Cyanidation. (Russian.) E. N. Druzhinina. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 70-73.

Confirms positive influence of preliminary electrochemical cleaning of parts and of Al chip introduced into muffle furnace at 550 to 600 C. Tables, micrographs. 6 ref.

5325* Continuous Annealing With Carbon Restoration of Coils and Bars. J. D. Armour. *Wire and Wire Products*, v. 28, Dec. 1953, p. 1305-1309, 1359.

Presents methods of annealing with prepared atmospheres and C restoration. Photographs, micrographs, graph.

See also:
4992 (gas in heat treating)

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5326* Alloys With a Fixed Rate of Dilatation. (English.) *Aciers Fins & Spéciaux Francais*, 1953, no. 13, Mar., p. 82-85.

Discusses physical properties of Fe-Ni, Fe-Cr, and Fe-Ni-Co alloys. Tables, graph.

5327* Auto-Stresses in Steel Parts. (English.) *Aciers Fins & Spéciaux Francais*, 1953, no. 15, Nov., p. 32-36.

Considers production, measurement, effects, stress relief, and suppression of auto-stresses. 4 ref.

5328* High Carbon Wire for Prestressed Concrete. (English.) *Aciers Fins & Spéciaux Francais*, 1953, no. 15, Nov., p. 43-46.

Steel wire specially designed for requirements of prestressed concrete are discussed. Photographs.

5329 Some Plastic Properties of Nickel Alloys. (English.) V. F. Zackay and T. H. Hazlett. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 624-628.

Data on Ni-Fe alloys show that Fe effectively solution-hardens Ni. Tables, graphs. 5 ref.

5330 Tensile Deformation of High-Purity Copper as a Function of Temperature, Strain Rate, and Grain Size. (English.) R. P. Carreker, Jr. and W. R. Hibbard, Jr. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 654-655, 657-663.

Effect of rate was investigated by rate-change tests over the same ranges of temperature and grain size. Graphs, tables, diagram. 21 ref.

5331 Deformation Mechanisms in Titanium at Elevated Temperatures. (English.) C. J. McHargue and J. P. Hammond. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 700-701, 703-705.

Study of coarse-grained specimens deformed in tension at 815 C. Diagrams, micrographs, table. 9 ref.

5332 The Dynamic Yielding of Mild Steel. (English.) J. D. Campbell. *Acta Metallurgica*, v. 1, no. 6, 1953, p. 706-710.

Results of dynamic and impact tests on mild steel are reviewed. A criterion for dynamic yield is proposed. Graphs. 15 ref.

5333 Heat Capacity and Resistance Measurements for Aluminum and Lead Wires. (English.) T. E. Pochapsky. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 747-751.

Both heat capacities and temperatures coefficients of resistance increase with temperature in such a way as to suggest that they are influenced by a single activated process rather than by impurities. Graphs, tables. 11 ref.

5334* Bauschinger Effect by Torsion of Copper Wires. M. J. Druyvesteyn and C. F. Étienne. *Applied Scientific Research*, v. 4, sec. A, no. 2, 1953, p. 100-104.

Discusses influence of amount of deformation, temperature, and preliminary stretching. Graphs. 5 ref.

5335* A Method of Making Edgewise Bend Tests of Rectangular Bus Bar. C. O. Smith and F. M. Howell. *ASTM Bulletin*, 1953, no. 194, p. 58-61.

Apparatus and techniques are described. Diagram, tables, photograph.

5336 WADC Evaluates Magnesium: Good, But—. Irving Stone. *Aviation Week*, v. 59, Dec. 28, 1953, p. 34-37.

Designers and producers must take into account light metal's sensitivity to "incorrect" handling. Photographs.

5337* Fatigue Properties of Cast Iron. G. N. J. Gilbert. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Dec. 1953, p. 94-108.

General discussion including Orowan's theory of fatigue. Graphs, diagrams, tables. 12 ref.

5338* Comprehensive Mechanical Tests on an Acicular Cast Iron. K. B. Palmer. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Dec. 1953, p. 109-117 + 1 plate.

Results of tests on typical 30-ton tensile acicular cast iron, carried out on reasonably uniform test pieces. Tables, graphs, micrographs.

5339 On the Properties of Spheroidal Graphite Cast Iron. M. Ballay, R. Chavy, and J. Grilliat. *Henry Brutcher, Altadena, Cal., Translation no.* 2952, 2 p. (Abstract from *Fonderie*, v. 68, 1951, p. 2589-2604; v. 69, 1951, p. 2636-2652.)

Selected data on mechanical properties of Mg treated cast irons

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in different conditions of heat treatment. Particulars on bar and block specimens used; accumulations of graphite spheroids in certain zones of test bars. Table, diagram.

5340 Mechanism of Action of Inhibitors Upon Hydrogen Embrittlement of Steel in Sulfuric Acid. Z. A. Iofa and E. I. Lyakhovetskaya. *Henry Brutcher, Altadena, Cal., Translation no.* 3048, 9 p. (From *Doklady Akademii Nauk SSSR*, v. 86, no. 3, 1952, p. 577-580.)

Discusses embrittlement of steel wire induced by cathodic polarization in pure H_2SO_4 and in H_2SO_4 containing various additions. Tables. 11 ref.

5341* Questions of Conformity in Relaxation and Speed Characteristics During Plastic Extension. (Russian.) L. I. Vasil'ev. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 301-302.

New data on above correlates theory and experimental results using specimens of Sn, Cu, Ni and Cu-Ni wire.

5342* Wear Resistance of Diffusion Chromium Plated Carbon Steel in the Presence of Certain Liquid Media. (Russian.) M. M. Khrushchov, M. A. Babichev, and G. N. Dubinin. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 303-306.

Investigations were made in 5% K_2CrO_4 solution in distilled water. Wear resistance is not determined by hardness of steel. Tables, graphs. 4 ref.

5343* Ferromagnetic Resonance of Nickel-Zinc Ferrites. (Russian.) E. I. Kondorskii and N. A. Smol'kov. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 237-240.

Ferrites investigated were in the form of solid solutions. Specimens were machined by abrasives and had the aspect of washers with a thickness of 1.00-1.03 mm. and with an external diameter of 16 mm. and an internal diameter of 5 mm. Diagram, graphs, table. 10 ref.

5344* Resonance Absorption in Metals in Centrimetric Waves. (Russian.) S. G. Salikhov. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 241-244.

Results of measurement of resonance absorption in 28 paramagnetic and composite-diamagnetic metals at temperatures of 290 and 90 K on a frequency 9.378×10^9 cycles per sec. are presented. Data obtained on form and intensity of lines of paramagnetic absorption differ appreciably from results of measurements on low frequencies. Table, graphs. 5 ref.

5345* Plastic Deformation and Fracture During Torsion. (Russian.) F. P. Rybalko. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 471-473.

Investigations were devoted to study of connection between plasticity of metals and appearance of macro-evidence of deformation. Graph. 7 ref.

5346* Influence of Plastic Deformation on the Form of the Curve of Iron and Nickel Magnetization in the Area of High Magnetic Fields. (Russian.) V. V. Parfenov. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 435-438.

Indicates influence of torsion and elongation on magnetization in a magnetic field of up to 10000 oersteds. Graphs. 11 ref.

5347* Heat Conductivity of Ferromagnetic Metals at Low Temperatures. (Russian.) A. I. Rezanov and V. I. Cherepanov. *Doklady Akademii Nauk SSSR*, v. 93, no. 4, Dec. 1, 1953, p. 641-644.

Calculations were made of thermal resistance at low temperatures. Comparisons were made with thermal resistance of the ionic lattice. 3 ref.

5348* Certain Characteristics of Variable Rate of Plastic Elongation. (Russian.) L. I. Vasil'ev and L. I. Eremina. *Doklady Akademii Nauk SSSR*, v. 93, no. 6, Dec. 21, 1953, p. 1019-1020.

Compares results of experiments using Al specimens with previous tests using Cu and Sn. Graph. 3 ref.

5349* Criteria of Similarity of Phenomena of the Surface Effect in Ferromagnetic Bodies. (Russian.) I. M. Kirko. *Doklady Akademii Nauk SSSR*, v. 93, no. 6, Dec. 21, 1953, p. 1029-1031.

Discusses effects of weak and strong fields on magnetic permeability. Graphs. 9 ref.

5350 Materials for High Temperature Service. III. Howard C. Cross. *Industrial Heating*, v. 20, Dec. 1953, p. 2416, 2418, 2420.

Properties of various metals alloys, cermets, and ceramic materials are discussed. Graph. (To be continued.)

5351 The Low-Stress Torsional Creep Properties of Pure Aluminium. W. Betteridge. *Institute of Metals, Journal*, v. 82, Dec. 1953, p. 149-161.

Creep properties of pure Al at 200 C have been determined by a high-sensitivity torsion method, at a torque producing a maximum elastic shear strain of $2{\cdot}8 \times 10^{-5}$. Creep strain has been shown to be primarily dependent on amount of cold work applied to material and on time and temperature of annealing treatments given before the creep test. Tables, graphs, diagram. 21 ref.

5352 The Effects of Some Constitutional Factors on the Creep and Fatigue Properties of Lead and Lead Alloys. L. M. T. Hopkin and C. J. Thwaites. *Institute of Metals, Journal*, v. 82, Dec. 1953, p. 181-196 + 7 plates.

Tin, Cu, and Sb were added to high purity Pb. Fine grains and presence of dispersed phases increased creep resistance. Fatigue resistance was increased more in single phase alloys than in two-phase systems. Aging effects were also studied. Graphs, tables. 53 ref.

5353 Fracture of Alpha Iron. Constance F. Tipper and E. O. Hall. *Iron & Steel*, v. 26, Dec. 11, 1953, p. 594-597; disc., p. 659-662.

Abridged from paper presented at Iron and Steel Institute, Autumn General Meeting, 1953. Results of investigation to determine amount of plastic deformation involved in fracture of crystals when such fracture was of cleavage type. Diagrams, graphs, table, micrographs.

5354 Iron-Oxygen Alloys. W. P. Rees and B. E. Hopkins. *Iron & Steel*, v. 26, Dec. 11, 1953, p. 597-600; disc., p. 659-662.

Abridged from paper presented at Iron and Steel Institute, Autumn General Meeting, 1953. Presents results of tensile and V-notched Charpy impact tests over temperature range covering tough to brittle transition. Table, micrographs.

5355 Propagation of Brittle Fracture in Steel. T. S. Robertson. *Iron and Steel Institute, Journal*, v. 175, Dec. 1953, p. 361-374 + 4 plates.

Paper describes development of a new test which applies a known transverse stress and assesses material through its ability to arrest a running crack. Diagrams, graphs, tables.

5356 The Density of Molten Iron. V. H. Stott and J. H. Rendall. *Iron and Steel Institute, Journal*, v. 175, Dec. 1953, p. 375-378.

Two closely agreeing measurements of density of molten iron (averaging 7.00 g./c.c. at 1564 C.) have been made by filling in *vacuo* a pyknometer made of alumina and determining mass of iron contained in it. Diagram. 14 ref.

5357* Change of Magnetic Properties of Magnets Which Are Under Large Compression Stresses. (Russian.) M. A. Grabovskii and E. I. Parkhomenko. *Izvestiia Akademii Nauk SSSSR, Seriia Geofizicheskaia*, 1953, no. 5, p. 405-417.

Magnetite specimens were subjected to uniaxial compression. Results are discussed. Graphs, diagram. 17 ref.

5358* Determination of the Direction of Magnetization of Disturbed Bodies According to the Results of Magnetic Survey. (Russian.) D. S. Mikov. *Izvestiia Akademii Nauk SSSR, Seriia Geofizicheskaia*, 1953, no. 5, p. 418-423.

Method was expounded for two-dimensional bodies. Discusses importance for interpretation of magnetic survey data. Graph, table.

5359* Impact Transition Temperatures and Aging Properties of Titanium Stabilized Mild Steels. (Swedish.) Ake

Josefsson and Bengt Nelson. *Jernkontorets Annaler*, v. 137, no. 10, 1953, p. 725-743.

Influence of fixing C and N as soluble Ti carbides and nitrides on transition temperature in the Charpy test. Graphs, micrographs, tables. 13 ref.

5360 Lattice Dynamics of Body-Centered and Face-Centered Cubic Metallic Elements. Jules de Launay. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1975-1986.

Includes diagrams. 16 ref.

5361* Some Compounds of Cobalt and Iron With Very Weak and Constant Paramagnetism. (French.) A. Serres. *Journal de physique et la radium*, v. 14, no. 12, Dec. 1953, p. 689-690.

Magnetization coefficients of several La alloys with Fe and Co were measured. Tables. 7 ref.

5362* Mechanical Properties of Basic Open Hearth Carbon Steel. (Russian.) S. L. Levin, S. N. Mylko, and I. P. Kazachkov. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 1-4.

Discusses factors influencing formation of hot cracks in castings. Describes techniques of melting and effect of C content and pouring temperature. Tables, graphs. 6 ref.

5363* Durability of High Phosphorus Perlitic Cast Iron. (Russian.) V. B. Liadskii. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 16-17.

Describes results of laboratory wear tests. Sliding and rolling friction resistance was determined. Tables, diagrams. 9 ref.

5364 Brittle Failure of Nonship Steel-Plate Structures. M. E. Shank. *Mechanical Engineering*, v. 76, Jan. 1954, p. 23-28.

Summary of report to the Committee on Ship Structural Design, National Academy of Science—National Research Council. A survey of non-ship brittle failures of carbon-plate steel structure to determine factors relating to such failures. Photographs.

5365 Intercrystalline Brittleness. A. R. Bailey, S. Morris, and A. J. K. Wiesiolek. *Metal Industry*, v. 83, Dec. 18, 1953, p. 497-498.

Investigates delayed intercrystalline failure under sustained tensile stress in air of sand-cast ternary β brass containing about 4% Al. Table. 8 ref.

5366* Hardness Testing of Cast-Copper Alloys. (German.) **I.** P. Melchior. **II.** H. Meichsner. *Metall*, v. 7, nos. 11-12, June, p. 433-436; nos. 23-24, Dec. 1953, p. 1007-1009.

Part I shows that three sec. are adequate for loading interval in Brinell hardness test. Part II presents experimental data showing that proposed reduction of impression time is neither necessary nor desirable. Tables, graphs, micrographs.

5367* Symposium on Brittle Fracture in Leoben. (German.) O. Werner. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 901-905.

Lectures on phenomena, mechanism, causes, and structural processes of brittle fracture. Proposes methods of testing. 11 ref.

5368* Explanation of the Supporting Effect in Alternating Stress. (German.) H. O. Meuth. *Metall*, v. 7, nos. 23-24, Dec. 1953, p. 974-977.

Discusses effect of a notch on alternating and statically stressed materials. Diagrams, graphs. 24 ref.

5369* Formation of Slip Lines on Plastically Deformed Metal Surfaces. II-III. (German.) W. Späth. *Metalloberfläche*, Ausgabe A, v. 7, no. 12, Dec. 1953, p. 177-183.

Presents a literature review on slip lines and bands. Explains mechanism of slipping which was shown to generate ultrasound waves. Effect of temperature on slip band width is discussed. Correlation between slip band width and ultrasonic frequnecies of different metals was made. Diagrams, tables. 34 ref.

5370 American Developments in Alloys for High Temperatures. C. L. Clark. *Metal Progress*, v. 65, Jan. 1954, p. 72-76.

Discusses compositions and mechanical properties of low- and high-alloy steels and other heat resistant alloys. Graphs, tables.

5371 Influence of Microstructure on the Hot Strength of Steel. Georges Delbart and Michel Ravery. *Metal Treatment and Drop Forging*, v. 20, Dec. 1953, p. 579-589.

Creep tests were carried out at 450 and 575 C. Influence of preliminary heating and soaking was investigated. Tables, graphs, micrographs. 5 ref.

5372 An Acoustic Study of the ΔE-Effect and the Damping of the Elastic Waves in Polycrystalline Nickel. V. P. Sizov. *National Science Foundation Translation no.* 31, July 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 427.)

Presents results of an experimental study of effect of magnetic field and elastic stresses in polycrystalline Ni. Graphs. 6 ref.

5373 Some Data on the Relation of Relaxation and Rate Characteristics in Plastic Deformation. L. I. Vasilyev. *National Science Foundation Translation, no* 33, July 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 451.)

Tests were made on wires of Cu, Ni, Cu-Ni alloy, and Sn. Graphs. 10 ref.

5374 A Study of the Effect of Pressure on Magnetic Saturation of Iron at the Temperature of Liquid Nitrogen. F. Galperin, S. Larin, and A. Shishkov. *National Science Foundation Translation, no* 36, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 419.)

Experiments were conducted at −196 C and 20 C. Gas which does not solidify at 77 K and 2000 atmospheres was used as compressing medium. Table, diagrams. 7 ref.

5375 Effect of Plastic Deformation on Subsequent Decomposition in Aluminum Alloys. N. N. Buinov and L. I. Podrezov. *National Science Foundation Translation no.* 41, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 665.)

Electron-microscopic analysis of an Al-Ag alloy shows that decomposition in surface layer of the alloy differed from that in the interior. Micrographs. 9 ref.

5376 Jumplike Deformation in the Linear "Elastic" Range of the Strain Diagram. N. F. Syutkin. *National Science Foundation Translation, no.* 74, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 91, 1953, p. 83-85.)

Jumplike deformation was observed in a Zn-Al alloy during elastic extension. Test equipment is described. Graphs. 3 ref.

5377 Measurements of Melting Points of Metals Under Extremely High Pressures. V. P. Butuzov, M. G. Gonikberg, and S. P. Smirnov. *National Science Foundation Translation, no.* 76, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, no. 4, Apr. 1953, p. 651-653.)

Previously abstracted. See item no. 986. v. 3, Jan. 1954.

5378 A Study of Isochromatic Lines in Transparent Models Under Finite Plastic Deformation. S. I. Gubkin and S. I. Dobrokolsky. *National Science Foundation Translation, no.* 83, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 799-802.)

Pattern formed by isochromatics is determined by type of load, shape of loaded body, and apparatus employed. Micrographs.

5379 Internal Friction and Shear Modulus of Pure Copper and Beryllium Bronze. V. S. Postnikov. *National Science Foundation Translation no.* 86, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 91, no. 1, July 1953, p. 79-82.)

Studies were made on internal friction and shear modulus as depending on temperature and soaking time. Graphs. 6 ref.

5380* Stress-Strain Records at High Straining Rates. Francis G. Tatnall and Greer Ellis. *Nondestructive Testing*, v. 11, Nov.-Dec. 1953, p. 32-34.

Trials of suggested instrumentation for recording X-Y load-deformation curves of structural parts and components subjected to pulses, shocks, impacts, vibrations, and alternating loads at frequencies encountered in service. Diagrams, photographs, oscillograms.

Metals—Mechanical and Physical Properties

5381* Present Status of the Testing of Iron Castings. (Hungarian.) Tibor Lukácsfalvi. *Öntöde*, v. 4, no. 9, Sept., p. 196-201.

Necessity and usefulness of various tests are discussed. Impact, fatigue limit, dumping capacity, and non-destructive tests, are outlined. Diagrams, micrographs. 13 ref.

5382* The Effect of Low Temperatures on Plasticity of Steels Used in Metallic Constructions. (French.) A. Chagneau. *Ossature metallique*, v. 18, no. 11, Nov. 1953, p. 577-580.

Discusses changes in mechanical properties of metals and alloys in tension, drop, fatigue, hardness, and impact tests. Outlines MacAdam theory to explain influence of low temperatures. Graphs.

5383 Thermoelectric Power of Monovalent Metals at High Temperature. D. K. C. MacDonald and S. K. Roy. *Philosophical Magazine*, v. 44, 7th ser., no. 359, Dec. 1953, p. 1364-1370.

Band theory of metals is applied to analyze thermoelectric power of "simple" metals at high temperatures. Graphs, tables. 5 ref.

5384 Second-Order Elastic Deformation of Solids. D. S. Hughes and J. L. Kelly. *Physical Review*, v. 92, ser. 2, Dec. 1, 1953, p. 1145-1149.

Expressions for velocities of elastic waves in stressed solids were derived using Murnaghan's theory of finite deformations and third order terms in the energy. Graphs, tables, diagrams. 14 ref.

5385 Search for the Hall Effect in a Superconductor. I. Experiment. H. W. Lewis. *Physical Review*, v. 92, ser. 2, Dec. 1, 1953, p. 1149-1151.

A search for a Hall effect in super conducting V proved negative but an upper limit of 150×10^{-8} electromagnetic units was established. 3 ref.

5386 Plastic Deformation and the Electric Strength of Alkali Halide Crystals. R. Cooper and A. A. Wallace. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1113-1115.

Photo-elastic method was used to detect birefringence due to plastic deformation. Apparatus used is illustrated. Micrographs, diagram. 4 ref.

5387* Calculation of the Profile of a Rotating Disc for Creep Conditions. (Russian.) A. G. Kostiuk. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 615-618.

Considers thin disc with stationary creep conditions. 3 ref.

5388 Deformation in Copper and Alpha Brasses. A. M. Halstead, J. M. McCaughey, and H. Markus. *Product Engineering*, v. 25, Jan. 1954, p. 180-185.

Clarification of true nature of stress-strain relationship and cause of initial deformation. Tables, photographs, graphs. 9 ref.

5389 The Study of Surface Reactions With the Aid of Large Metal Crystals. Allan T. Gwathmey. *Record of Chemical Progress*, v. 14, no. 3, 1953, p. 116-129.

Describes single crystal method of studying surface reactions, emphasizing importance of crystal face. Different faces of crystal often behave as if they were different metals. Diagrams, photographs, table. 14 ref.

5390 Electrolytic Cold-Working and Internal Friction in Palladium/Hydrogen Alloys. F. A. Lewis, G. E. Roberts, and A. R. Ubbelohde. *Royal Society, Proceedings*, v. 220, ser. A, Dec. 8, 1953, p. 279-289.

Effects of hydrogen on elastic moduli of Pd are only small. Graphs, photograph, diagrams. 18 ref.

5391* X-Ray Invesitgation on the Internal Stresses in Plastically Elongated Iron. (German.) Eugen Kappler and Ludwig Reimer. *Zeitschrift für angewandte Physik*, v. 5, no. 11, Nov. 1953, p. 401-406.

Grunoughs theory was expanded by applying obliquely incident X-rays. Results confirm theory. Stress-lattice constant diagrams explain high internal stresses of Fe. Graphs. 14 ref.

5392* An Amplitude- and Temperature-Dependent Hysteresis of Alpha Iron at —70 C. (German.) Günther Sorger. *Zietschrift für angewandte Physik*, v. 5, no. 11, Nov. 1953, p. 406-413.

Experimental and theoretical studies were made to explain hysteresis losses in an Fe-Si alloy with decreasing temperature. Table, graphs. 8 ref.

5393* The Electrical Properties of Thin Vapor-Deposited Silver Films at 3000 Megacycles. (German.) Friedrich J. Tischer. *Zietschrift für angewandte Physik*, v. 5, no. 11, Nov. 1953, p. 413-415.

Theoretical investigation of wave expansion through Ag films. Discusses depth of penetration, reflexion, and transmission factors. Graphs, table.

Books and Miscellaneous Publications

5394 Symposium on Fatigue With Emphasis on Statistical Approach. II. ASTM Special Technical Publication no. 137, 91 p. 1953. American Society for Testing Materials, Philadephia 3, Pa. (TA460 Am35sf)

Individual papers are separately abstracted.

5395 The Statistical Nature of the Fatigue Properties of SAE 4340 Steel Forgings. J. T. Ransom and R. F. Mehl. Paper from SYMPOSIUM ON FATIGUE WITH EMPHASIS ON STATISTICAL APPROACH. II. ASTM SPECIAL TECHNICAL PUBLICATION no. 137. p. 3-21; disc., p. 21-24. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA460 Am35sf)

High and low quality forgings of same tensile strength level were studied. Specimens were taken in longitudinal and transverse directions. Procedures were used to permit statistical analysis of variability of endurance limit and life to failure. Tables, diagrams, graphs. 15 ref.

5396 The Statistical Behavior of Fatigue Properties and the Influence of Metallurgical Factors. E. Epremian and R. F. Mehl. Paper from SYMPOSIUM ON FATIGUE WITH EMPHASIS ON STATISTICAL APPROACH. II. ASTM SPECIAL TECHNICAL PUBLICATION no. 137. p. 25-54; disc., p. 55-57. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA460 Am35sf)

Includes tables, graphs, diagrams. 23 ref.

5397 A Statistical Interpretation of the Effect of Understressing on Fatigue Strength. E. Epremian and R. F. Mehl. Paper from SYMPOSIUM ON FATIGUE WITH EMPHASIS ON STATISTICAL APPROACH. II. ASTM SPECIAL TECHNICAL PUBLICATION no. 137. p. 58-64; disc., p. 65-69. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA460 Am35sf)

Purpose of investigation was to study understressing effect from a statistical viewpoint. Tables, graphs.

5398 Fatigue Properties of Large Specimens With Related Size and Statistical Effects. Oscar J. Horger and Harry R. Neifert. Paper from SYMPOSIUM ON FATIGUE WITH EMPHASIS ON STATISTICAL APPROACH. II. ASTM SPECIAL TECHNICAL PUBLICATION no. 137. p. 70-89; disc., p. 90-91. 1953. American Society for Testing Materials, Philadelphia 3, Pa. (TA460 Am35sf)

Summarizes results of rotating-bending fatigue tests on shafts 0.3- to 6-in. diameter from ASE plain carbon steels of 0.39 and 0.54% carbon content in both the "as-forged" and normalized-and-tempered conditions. Shafts were tested with stress concentration, as represented by both fillets and press-fitted members, as well as plain specimens. Diagrams, micrographs, tables, photograph. 14 ref.

5399 Progress in Metal Physics. Bruce Chalmers, editor. v. IV. 403 p. 1953. Interscience Publishers Inc., New York. (TA459 C35p)

Consists of seven papers separately abstracted.

5400 Internal Friction in Metals. A. S. Nowick. Paper from PROGRESS IN METAL PHYSICS. v. IV. p. 1-70. 1953. Interscience Publishers, Inc., New York. (TA459 C35p)

An attempt is made to provide a phenomenological description of general features of non-elastic deformation which is suf-

ficiently general to include anelasticity, static hysteresis, and amplitude dependent internal friction. Graphs, diagrams. 149 ref.

5401 Theory of Dislocations. A. H. Cottrell. Paper from PROGRESS IN METAL PHYSICS. v. IV. p. 205-264 + 2 plates. 1953. Interscience Publishers, Inc., New York. (TA459 C35p)

A review of progress. Diagrams, graphs. 160 ref.

See also:
4402 (properties of metal ceramic systems)
4724 (mechanical properties of stainless steel)
4728 (properties of Si cast iron)
4739 (strength of heat resistant alloy)
4743 (mechanical properties of Pb)
4755 (fatigue strength of fitted members)
4801 (embrittlement of cast iron)
5203 (properties of metals for reactor cores)
5211 (mechanical properties of continuous castings)
5453 (relationship of microstructures)
5469 (hydrogen diffusion in pickling of spring steel)
5473 (hardness of mixed carbides)
5483 (magnetic moments of metals and alloys)
5493 (effect of gases on properties of solid metals)

METALS—MECHANICAL WORKING

5402 Machinability and Microstructure. Hans J. Heine. *American Foundryman*, v. 25, Jan. 1954, p. 58-61.

Discusses effect of microstructure on machinability, strength, and hardness of a material. Micrographs, tables.

5403 Speed, Control and Uniformity in Soaking Pit Heating. P. F. Kinyoun. *American Iron and Steel Institute, Preprint*, Oct. 1, 1953, 11 p. (TS300 Am35ta)

Paper presented at Youngstown Regional Technical Meeting of AISI, Oct. 1, 1953. Discusses design of the pits; shape, size, composition and physical condition of the charge; type of fuel used; and final use of the product. Tables, drawing, photograph.

5404 Wide-Flanged Shells Draw Easily If You Follow the Rules. Stanley R. Cope. *American Machinist*, v. 98, Jan. 4, 1954, p. 100-103.

Discusses die design and deep drawing operations for production of wide flange shells. Diagrams.

5405 Many New Rolling Mill Installations Completed in 1953. A. F. Kenyon. *Blast Furnace and Steel Plant*, v. 42, Jan. 1954, p. 83-89.

Includes photographs, diagram, table, oscillograph.

5406 Straightening of Rolling Mill Products. E. Siebel. *Henry Brutcher, Altadena, Cal., Translation no.* 2815, 10 p. (From *Stahl und Eisen*, v. 72, no. 21, 1952, p. 1298-1301.)

Describes stresses and strains in elastic bending of wires and tubes. Discusses effect of straightening upon mechanical properties of stock. Diagrams, graphs.

5407 Friction, Wear, and Lubrication in Wire Drawing. W. Papsdorf. *Henry Brutcher, Altadena, Cal., Translation no.* 3050, 20 p. (From *Stahl und Eisen*, v. 72, no. 8, 1952, p. 393-399.)

After a brief survey of early use of lubricants in wire drawing, most recent knowledge in the field of friction is presented. Types of friction are classified. Graphs, diagrams. 16 ref.

5408 Effect of Processing Conditions on the Properties of Heavy Forgings for Steam Turbines. R. Schinn. *Henry Brutcher, Altadena, Cal., Translation no.* 3077, 18 p. (Condensed from *Stahl und Eisen*, v. 72, no. 12, 1952, p. 676-683.)

Discusses difficulties encountered in production of large forgings. Tables, graphs, micrographs, diagrams. 31 ref.

5409 Causes of Fine Surface Defects in the Hot Working of Plain Carbon Steel. H. Buchholtz and R. Pusch. *Henry Brutcher, Altadena, Cal., Translation no.* 3100, 23 p. (From *Stahl und Eisen*, v. 73, no. 4, Feb. 12, 1953, p. 204-212.)

Previously abstracted from original. See item no. 7707, v. 2, Aug. 1953.

5410 Investigation of Pressures and Work Required in the Cold Extrusion of a Number of Steels. H. D. Feldmann. *Henry Brutcher, Altadena, Cal., Translation no.* 3138, 16 p. (From *Stahl und Eisen*, v. 73, no. 3, 1953, p. 165-174.)

Experimental setup and procedure; measurement of pressures; pressure-gage arrangement; and pressure records are obtained. Diagrams, tables, graphs, photograph. 19 ref.

5411 Metal Soaps (Stearates) for the Drawing of Steel Wire. K. Schimz. *Henry Brutcher, Altadena, Cal., Translation no.* 3165, 4 p. (From *Draht, (German Ed.)*, v. 4, no. 8, 1953, p. 297.)

Discusses nature of metal soaps studied; data on their melting point, bulk density, and ignition residue. Describes best soaps for ordinary low-carbon and high-grade and alloy steels. Table.

5412 Improved Techniques Developed in Grinding Titanium Carbides. F. J. Lennon, Jr. *Iron Age*, v. 172, Dec. 17, 1953, p. 144-146.

Diamond wheels are recommended, but the more economical SiC wheels may be used if wheel speeds are kept in the low 3500 to 4000 sfpm range. Photographs.

5413 Induction Heating: Low Frequencies Have Advantages. J. A. Logan. *Iron Age*, v. 172, Dec. 24, 1953, p. 69-72.

Induction heating can be used in applications previously considered impractical because of the cost of high frequency motor generator sets. Photographs.

5414 Proper Tooling Simplifies Machining of Jet Parts. Dennis G. Jones. *Iron Age*, v. 172, Dec. 31, 1953, p. 76-79.

Wide use of high temperature, stainless, and Ti alloys for jet engine parts has raised new demands for improved tooling. Photographs, tables.

5415 Soaking Pit Practice at the Normanby Park Steelworks of John Lysaght Ltd. A. H. Norris. *Iron and Steel Institute, Journal*, v. 175, Dec. 1953, p. 353-359.

Paper deals with results of three years' experience of working a battery of one of the first post-war installations of one-way top-fired soaking pits. Results show how modern advances in instrumentation and construction have a considerable effect on heating efficiency, in regard to both heat consumption and quality of steel. Photographs, graphs, tables.

5416* 'Very Thin' Magnesium Strips Produced by Modified Hot Rolling. L. V. Martikonis. *Light Metal Age*, v. 11, Dec. 1953, p. 14-15.

Electric current applied so that Mg strip is the resistance element and the controlled flow of current developed desired temperature. Photographs.

5417* Abrasive Processing of Castings. (Russian.) M. I. Borisov, E. G. Rutter, and I. I. Sankov. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 12-15.

Describes operation of semi-automatic machine. Diagrams, tables.

5418 Improving the Fatigue Life of Springs by Liquid Honing. H. J. Steel. *Machinery (London)*, v. 83, Dec. 4, 1953, p. 1083-1093.

Discusses process of liquid honing, techniques of testing fatigue life, and variables to be considered in treatment of springs. Photographs, micrographs, diagrams, tables, graphs.

5419 Electro-Mechanical Methods for Machining and Grinding Cemented Carbides. *Machinery (London)*, v. 83, Dec. 11, 1953, p. 1146-1148.

Describes equipment, techniques, and advantages of process. Reports experimental studies to determine rate of grinding and wheel wear. Table.

5420 Developing a Test for Broaching Titanium and Its Alloys. R. E. McKee and W. W. Gilbert. *Mechanical Engineering*, v. 76, Jan. 1954, p. 6-12.

Test procedure and criteria for measuring effect of broaching on tool life. Graphs, photographs, tables.

Metals—Mechanical Working

5421* Problems of Shaping Sheet Metals. (German.) E. Siebel. *Metall*, v. 7, nos. 23-24, Dec. 1953, p. 970-973.

Discusses cupping, deep drawing, expanding, and spinning methods. Diagrams. 7 ref.

5422* Ingot Holders of Metal-Extrusion Presses. (German.) H. M. Hiller. *Metall*, v. 7, nos. 23-24, Dec. 1953, p. 993-1000.

Method for determining important data on designing ingot holders shows that inserts can be varied and adapted to plant requirements by varying degree of shrink fitting. Tables, diagrams, graphs. 5 ref.

5423 Production of Gas Turbine Blades. B. P. Dabell and L. H. Williams. *Metal Treatment and Drop Forgings*, v. 20, Dec. 1953, p. 571-578.

Various manufacturing techniques and advantages of precision casting and forging of blades are discussed. Photographs, table.

5424 Upset Forging. *Metal Trends*, v. 1, no. 4, 1953, p. 6-9.

Today's modern upset machines save weight, freight, and money. Diagram, photographs.

5425* Selecting a Mechanical or Hydraulic Press for Your Particular Job. Len Crary. *Modern Industrial Press*, v. 15, Dec. 1953, p. 50, 52, 54, 58, 60, 62, 64.

Solves various draw problems, selecting the proper press in each case. Diagrams, table.

5426* "Design Leadership" Slogan at Seattle Plant of Square D Company. Howard E. Jackson. *Modern Industrial Press*, v. 15, Dec. 1953, p. 36, 38, 40, 42, 44, 46, 48, 68.

Describes facilities for fabrication of sheet metal products. Photographs.

5427* O. B. I. Press—An Ideal General Purpose Machine. Ernest C. Morse. *Modern Industrial Press*, v. 15, Dec. 1953, p. 22, 24, 26, 30, 32, 34.

Describes line of presses. Photographs.

5428 Relation of [Abrasive] Wear to the Grinding Area. G. D. Polosatkin. *National Science Foundation Translation, no.* 42, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 971.)

A continuation and extension of previous investigations of relation between abrasive wear and metal cutting. Graphs.

5429* Andrew Laing Lecture. Internal Stresses in Some Types of Forging. Charles Sykes. *North East Coast Institution of Engineers & Shipbuilders, Transactions*, v. 70, Dec. 1953, p. 61-92.

Outlines considerations to be made in selection of heat-treatment cycles to produce shaft forgings. Tables, diagrams, graphs. 12 ref.

5430* Machining of Porous Chromium Parts. (Russian.) N. A. Kamenev, A. A. Mikhailov, and M. A. Shluger. *Stanki i Instrument*, v. 24, no. 10, Oct. 1953, p. 28-29.

Describes methods of maintaining geometrical form and means of preventing closing of pores. Graphs. 3 ref.

5431 Metallurgists Offer Cutting Tools a Bigger Bite. Robert F. Huber. *Steel*, v. 134, Jan. 11, 1954, p. 70-73.

Alloying elements improve machinability of basic steels but leave other physicals unchanged. Photographs, tables.

5432* Metal Spinning, Its Implications, and Applications. Lester F. Spencer. *Steel Processing*, v. 39, Dec. 1953, p. 631-640.

Describes process, equipment requirements, materials, lubrication, techniques, and other basic considerations. Photographs, graphs, diagrams, tables. 9 ref.

5433* Magnesium Forming. III. In the Brake and Hydropress. Francis L. Coenen. *Tool Engineer*, v. 32, Jan. 1954, p. 65-72.

Discusses factors which must be given special consideration in working with Mg, including minimum bend radii, forming temperature, and time at temperature. Photographs, graphs, diagrams.

5434* Drop Forging. Ralph H. Eshelman. *Tool Engineer*, v. 32, Jan. 1954, p. 73-82.

Process and equipment; supplementary operations; materials; costs; die design; and recent developments are discussed. Photographs, diagrams, graphs, tables.

5435* Designing and Producing Large Forgings. (German.) H. Gummert. *VDI Zeitschrift des Vereines deutcher Ingenieure*, v. 95, no. 34, Dec. 1, 1953, p. 1141-1145.

Discusses forging machines, materials, heat treating, and shaping of different types of large forgings. Includes practical suggestions on procedure and testing. Tables, graphs, diagrams, photographs. 3 ref.

5436* Analysis of Factors Affecting Contact Area of a Shaving With the Face of the Tool and Average Normal Specific Pressure. (Russian.) A. M. Zhukov. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 52-56.

Discusses change of tool strength under various cutting conditions. Macrographs, graphs, tables. 4 ref.

5437* Increasing Efficiency of Forge Hammers. (Russian.) S. S. Lifshits. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 57-58.

Discusses possibility of increasing efficiency from 1.5 to 2 times and of decreasing steam expenditure by 30-50%. Tables, diagrams.

5438* Tooling Applications. *Western Machinery and Steel World*, v. 44, Dec. 1953, p. 108-109.

Cost-cutting applications of WC milling cutters. Photographs, diagrams.

5439* Rod and Wire Quality vs. Cold Heading Quality. William E. Hill, Jr. *Wire and Wire Products*, v. 28, Dec. 1953, p. 1291-1293, 1357-1359.

Improper uses to which cold heading rods and wire may be put that can result in unsatisfactory products are discussed. Photographs.

5440* Electric Motors and Control for Slip Type Wire Drawing Machines. H. A. Dickerson. *Wire and Wire Products*, v. 28, Dec. 1953, p. 1295-1304, 1334-1337, 1339, 1341, 1343.

Describes motors and controls used in drawing Cu-wire for electrical conductors. Graphs, diagrams, photographs.

5441* How Cold Reduction Affects Several Properties of 18/8 Stainless Steel Wire. Samuel Storchheim. *Wire and Wire Products*, v. 28, Dec. 1953, p. 1310-1311, 1314.

Presents results of experimental studies. Tables, graphs. 2 ref.

See also:

4747 (corrosion of cutting tools)
5219 (electrical developments in rolling mills)
5266 (integration of casting and machining)
5313 (elimination of grinding cracks)
5316 (machinability of structural steel)

METALS—METALLOGRAPHY, TRANSFORMATIONS, AND STRUCTURES

5442 The Isothermal Transformation of Metastable Beta-Uranium Single Crystals. (English.) A. N. Holden. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 617-623.

Individual U martensite plates formed and grew at a slow rate isothermally. Diagrams, micrographs. 8 ref.

5443 Local Atomic Arrangements in Gold-Nickel Alloys. (English.) P. A. Flinn, B. L. Averbach, and Morris Cohen. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 665-673.

These alloys exhibit a preference for *unlike* neighbors above the solubility temperature and have short range order analogous to that in Cu-Au alloys. Diagrams, graphs, tables. 14 ref.

5444 The Influence of Oxygen Contents on Transformations in a Titanium Alloy Containing 11 Per Cent Molybde-

num. (English.) D. J. Delazaro and W. Rostoker. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 674-678.

Presence of oxygen was correlated with occurrence of sub-grain boundary structures and abnormal variations in precipitation rates from grain to grain. Micrographs, graphs. 5 ref.

5445 The Kinetics of Precipitation of Barium Sulfate From Aqueous Solution. (English.) D. Turnbull. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 685-691.

Rate of linear growth of $BaSO_4$ crystals is independent of their size and apparently limited by a process occurring at the crystal-solution interface. Graphs, tables. 15 ref.

5446 The Measuring of Lattice Distortions in Metal Single Crystals. (French.) H. Lambot, L. Vassamillet, and J. Dejace. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 711-719.

Use of a converging X-ray beam obtained by means of a curved quartz monochromator enables one to determine angular distortions of a crystal lattice. Single crystal to be studied is irradiated along one or two narrow bands, approximately 50 microns in width. Diagrams. 11 ref.

5447 Ternary Laves and Sigma-Phases of Transition Metals. (English.) Kehsin Kuo. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 720-724.

Discusses formation of substitutional phases and intermetallic compounds by metals which adjoin each other in periodic system. Tables. 24 ref.

5448 Order-Disorder in Cu-Au Alloys. I. Short-Range Order in an Alloy Containing 23 Atomic Per Cent Au. (English.) C. H. Sutcliffe and F. E. Jaumot, Jr. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 725-730.

Measurements of diffuse background intensity was made throughout reciprocal lattice unit cell and analyzed by means of a three-dimensional Fourier analysis. Short-range order parameters are given for the first ten shells surrounding a given atom for three temperatures above the critical temperature. Tables, diagram, graph. 7 ref.

5449 Magnetic and Crystallographic Studies on the Higher Antimonies of Iron, Cobalt and Nickel. (English.) Terkel Rosenqvist. *Acta Metallurgica*, v. 1, no. 6, Nov. 1953, p. 761-763.

Small deviations between observed and theoretical magnetic moments and between observed and calculated values for Sb-Sb distance are regarded as a result of a transition towards metallic binding, whereby some of the valency electrons are promoted to an electron gas or conduction band. Graphs, tables. 4 ref.

5450* A New Method of Polishing and Etching of Metallographic Specimens of Tungsten and Molybdenum. (Hungarian.) Tivadar Millner and Lóránt Sass. *Aluminium (Budapest)*, v. 5, no. 10, Oct. 1953, p. 214-215.

Describes a solution prepared for grain boundary etching. Micrographs. 3 ref.

5451* Isothermal Transformations in Cast Iron. J. Ings. *Australasian Engineer*, 1953, Nov., p. 62-67.

Discusses problems in producing high quality cast iron. Photographs, graphs. 10 ref.

5452 Practical Aspects of Structure and Segregation in Killed Steel Ingot Solidification. Edward A. Loria and Richard L. Keller. *Blast Furnace and Steel Plant*, v. 42, Jan. 1954, p. 45-51.

Internal soundness and segregation of electric furnace killed steel ingots have been illustrated in terms of grade, ingot size, and cooling rate. Photographs, table. 19 ref.

5453* A Relationship of Microstructure to the Mechanical Properties of White Irons. W. J. Williams. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Dec. 1953, p. 132-134 + 6 plates.

Presents results of experimental studies. Photographs. 2 ref.

5454 Is Proeutectoid Ferrite or Cementite Continuous With Pearlite Cementite. S. Modin. *Henry Brutcher, Altadena, Cal., Translation no.* 2810, 6 p. (From *Jernkontorets Annaler*, v. 135, no. 4, 1951, p. 169-174.)

Microscopic study of one hypereutectoid and three hypoeutectoid carbon steels, all having a coarse lamellar pearlite structure. Micrographs. 6 ref.

5455 Diffusion of Elements in Liquid Iron. B. V. Stark, E. V. Chelishchev, and E. A. Kazachkov. *Henry Brutcher, Altadena, Cal., Translation no.* 2840, 7 p. (From *Izvestiya Akademii Nauk SSSR, OTN*, 1951, no. 11, p. 1689-1695.)

Experimental determination of coefficient of diffusion of Mn and Si in liquid iron. Tables, diagram, graphs.

5456 Incubation Time of Austenite Transformation With Different Types of Cooling. F. Wever and O. Krisement. *Henry Brutcher, Altadena, Cal., Translation no.* 3039, 30 p. (From *Archiv für das Eisenhüttenwesen*, v. 23, nos. 5-6, 1952, p. 229-237.)

Discusses Scheil's theory and formula enabling calculation of continuous time temperature transformation diagrams for a given continuous cooling from isothermal time temperature transformation diagrams, and vice versa. Describes development of conversion formula for "linear" and Newtonian cooling. Table, graphs. 13 ref.

5457 On the Structure of Spheroidal Graphite Cast Iron. A. Wittmoser. *Henry Brutcher, Altadena, Cal., Translation no.* 3069, 27 p. (Condensed from *Giesserei*, nos. 6-8, 1952, p. 323-334.)

Discusses difference in structure between spheroidal and lamellar graphite cast irons. Describes each test for revealing primary structure and identification of inclusions developed by etches and characterized by "walls". Micrographs, tables. 36 ref.

5458 Mechanism of Etching of Metals by Ionic Bombardment. G. V. Spivak, I. N. Prilezhaeva, and O. I. Savochkina. *Henry Brutcher, Atladena, Cal., Translation no.* 3079, 8 p. (From *Doklady Akademii Nauk SSSR*, v. 88, no. 3, 1953, p. 511-514.)

Studies were made of mechanism of cathodic atomization of metals in a gas discharge to develope their structure. Presents explanation of associated structural transformations on basis of modern theory of formation of ionic and metallic crystals. Graph, micrographs.

5459 Effect of Foreign Nuclei Upon Crystallization of Metals and Alloys, Particularly the Formation of Eutectic in Gray Iron. VII. Nucleation and Growth of Spheroidal Graphite. W. Patterson. *Henry Brutcher, Altadena, Cal., Translation no.* 3091, 14 p. (From *Giesserei Technisch-Wissenschaftliche Beihefte*, 1952, nos. 6-8, p. 375-378.)

Profound study of lattice relationships between graphite and foreign nuclei present in cast iron as governing formation of spheroidal or flake graphite. Graphs, diagrams, micrographs. 3 ref.

5460 On Diffusion Fronts in Technical Iron. V. I. Arkharov, et al. *Henry Brutcher, Altadena, Cal., Translation no.* 3099, 6 p. (From *Doklady Akademii Nauk SSSR*, v. 89, no 2, 1953, p. 269-270.)

Describes shape of diffusion front in case of impregnation of technical Fe with Cr and Al as against Ni, Cu, and Pd. Micrographs. 6 ref.

5461 Phase and Structural Transformations in Steel After Repeated Recrystallization. D. S. Kazarnovskii. *Henry Brutcher, Altadena, Cal., Translation no.* 3101, 9 p. (From *Doklady Akademii Nauk SSSR*, v. 87, new ser., no. 3, Nov. 21, 1952, p. 409-413.)

Previously abstracted from original. See item no. 11022, v. 2, Oct. 1953.

5462 Reactions Between Solid Iron and Liquid Aluminum and Aluminum Alloys. E. Gebhardt and W. Obrowski. *Henry Brutcher, Altadena, Cal., Translation no.* 3149, 19 p. (From *Zeitschrift für Metallkunde*, v. 44, no. 4, Apr. 1953, p. 154-160.)

Previously abstracted from original. See item no. 9415, v. 2, Sept. 1953.

Metals—Metallography, Transformations, and Structures

5463* Determining the Bonding Energy in the Austenite Lattice. (Russian.) Iu. V. Kornev. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 467-470.

Conclusion is made that addition of C to Fe noticeably decreases energy of the bond of the austenite lattice. Table, diagram, graph. 8 ref.

5464* Nature of Martensite. (Russian.) B. A. Apaev. *Doklady Akademii Nauk SSSR*, v. 93, no. 4, Dec. 1, 1953, p. 647-649.

Magnetic method was used to show that electrolytic precipitate of a hardened specimen is not martensitic carbide but a finely dispersed martensite powder. Graphs. 3 ref.

5465* Influence of Internal Grain Structure of Austenite on the Self Diffusion of Iron. (Russian.) P. L. Gruzin, E. V. Kurdiumov. *Doklady Akademii Nauk SSSR*, v. 93, no. 6, Dec. 21, 1953, p. 1021-1023.

Discusses effect of internal grain structure in investigating diffusion mechanism in alloys where there are phase tranformations. Graph. 6 ref.

5466* The Electric Resistance of Ni_3Fe Alloys Which Contain Molybdenum. (Russian.) B. G. Livshits and M. P. Ravdel. *Doklady Akademii Nauk SSSR*, v. 93, no. 6, Dec. 21, 1953, p. 1033-1035.

Shows that decreased ordering occurs continually with increased Mo content. Graphs. 11 ref.

5467* The Reaction of Nitrogen With, and the Diffusion of Nitrogen in, Beta Zirconium. M. W. Mallett, Jack Belle, and B. B. Cleland. *Electrochemical Society, Journal*, v. 101, Jan. 1954, p. 1-5.

Rate of reaction of N with high-purity Zr was determined for temperature range of 975 to 1640 C at 1 atmosphere pressure. Graphs, tables. 18 ref.

5468* The Reaction of Silver Alloys With Sulfur in Mineral Oil. II. Examination of Reaction Films and Mechanism of Reaction. H. O. Spauschus, R. W. Hardt, and R. T. Foley. *Electrochemical Society, Journal*, v. 101, Jan. 1954, p. 6-9.

Spectroscopic examination of films showed that sulfide films grown on Ag alloys of Cd, Sb, In, Tl, and Zn contained an appreciable quantity of the alloying element. Films grown on Al, Mg, and Mn alloys contained only a trace of the alloying element. Tables. 4 ref.

5469 The Problem of Hydrogen Diffusion in the Pickling of Spring Steel. J. S. Jackson. *Electrodepositors' Technical Society, Journal*, v. 28, 1951-1952, p. 89-98; disc., p. 98-101 + 2 plates.

It has been found that whereas hydrogen embrittlement only causes a slight reduction in fatigue limit, in cases of higher stress ranges results are very seriously lowered, especially in the case of hardened and tempered springs. Graphs, tables, diagram. 12 ref.

5470 The System Uranium-Lead. B. R. T. Frost and J. T. Maskrey. *Institute of Metals, Journal*, v. 82, Dec. 1953, p. 171-180.

System U-Pb has been investigated over whole composition range and up to 1250 C by micrographic, X-ray, and thermal-analysis methods. Diagrams, tables, graphs. 13 ref.

5471 New Methods Determine Grain Size Ultrasonically. Nicholas Grossman. *Iron Age*, v. 172, Dec. 31, 1953, p. 72-75.

Non-destructive test for grain size of metal in determining inherent physical character. Tables, oscillographs, graph.

5472 The Iron-Carbon Diagram. R. Whitfield. *Machinery (London)*, v. 83, Dec. 25, 1953, p. 1253-1255.

Discusses carbon contents of 1.5 to 4.3%. Diagram, table.

5473* The Tungsten Carbide-Titanium Carbide-Chromium Carbide System. (German.) O. Rüdiger. *Metall*, v. 7, nos. 23-24, Dec. 1953, p. 967-969.

Discusses X-ray, metallographic, and microhardness investigations. Table, graphs, micrographs.

5474* The Course of Segregation of Copper-Beryllium at High Temperature. (German.) W. Gruhl. *Metall*, v. 7, nos. 23-24, Dec. 1953, p. 978-982.

Describes resistance measurements, X-ray studies, and metallographic investigations of segregation of Be from supersaturated solid Cu-Be solutions at 500-750 C. Graphs, X-ray diagrams, tables, photomicrographs. 14 ref.

5475* Research on the Solubility of Titanium in Magnesium. (German.) H. Eisenreich. *Metall*, v. 7, nos. 23-24, Dec. 1953, p. 1003-1006.

Describes experiments of dissolving Ti in Mg by adding $TiCl_4$ to the melt and of casting into sand and chill molds. Graphs, tables, photomicrographs. 5 ref.

5476 Causes of the Effect of Small Dissolved Admixtures on the Kinetics of the Aging of Alloys. V. I. Arkharov, B. N. Varskoi, and N. N. Skornyakov. *National Science Foundation Translation, no.* 45, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 1003.)

Observations were made on strong accelerating effect of Sb on aging of many Ag and Cu alloys. Table, graphs. 6 ref.

5477 Frontal Diffusion in Iron of Commercial Purity. V. I. Arkharov, K. A. Yefremova, S. I. Ivanovskaya, A. K. Shtolts, and B. A. Yunikov. *National Science Foundation Translation, no.* 48, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 269.)

Studies were made of diffusion of several elements into iron. Different shapes of the diffusion front were observed. Micrographs. 6 ref.

5478 The Nonhomogeneity of Austenite. I. A. Oding and M. G. Lozinsky. *National Science Foundation Translation no.* 52, Aug. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 275-278.)

Studies were made of factors that apparently affect formation of non-homogeneous structure of austenite grains in steel. Diagram, graph, micrographs. 8 ref.

5479 Phase Changes During Electrospark Treatment of Metals and an Attempt to Establish Criteria for the Observed Interactions. L. S. Palatnik. *National Science Foundation Translation, no.* 53, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 455-458.)

Describes structural changes in surface layer of various metals subjected to electrospark treatment in air for about 100 combinations of unlike electrodes. Tables, graph. 6 ref.

5480 On the Effect of Certain Dissolved Admixtures on the Frontal Diffusion of Silver Into Polycrystalline Copper. V. I. Arkharov, S. I. Ivanovskaya, and N. N. Skornyakov. *National Science Foundation Translation, no.* 58, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, no. 4, Apr. 1953, p. 669-672.)

Previously abstracted. See item no. 1132. v. 3, Jan. 1954.

5481 X-Ray Analysis of the Initial Stages of Aging of Beryllium Bronze. A. M. Yelistratov, S. D. Finkelshtein, and T. Yu. Goldshtein. *National Science Foundation Translation, no.* 63, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 669-672.)

Presents results of study of structural changes and refers only to initial stages of aging before the alloy has reached maximum hardness and before lattice constant of the α-phase has changed. Micrographs. 8 ref.

5482 X-Ray Analysis of the Aging of Al-Zn Alloys. A. M. Yelistratov. *National Science Foundation Translation, no.* 65, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 803-806.)

A pure Al-Zn alloy, 25% zinc by weight, was studied. Samples were wires 0.1 to 0.5 mm. in diameter. They were quenched in ice water after heating at 44 C for two hours. Grain sizes ranged from 0.1 to 0.02 mm. Micrographs. 6 ref.

5483 Magnetic Moments and the Crystal Structure of Ferromagnetic Metals and Alloys. F. Glaperin. *National Science Foundation Translation, no.* 68, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 643-646.)

Shows that the simple formula previously proposed for magnetic

moments of ferromagnetic metals and other ferromagnets can be generalized to ferrites and to similar chemical compounds in satisfactory agreement with experiment. Table, graph. 12 ref.

5484 A Method for Determining Diffusion Coefficients. S. N. Kryukov and A. A. Zhukovitsky. *National Science Foundation Translation, no.* 71, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 90, 1953, p. 379-382.)

Proposes a radioactive tracer technique for determining diffusion coefficients. Graphs. 4 ref.

5485 Displacement of Grain Boundaries in Annealed Metal. I. A. Oding, M. G. Lozinsky, and S. G. Fedotov. *National Science Foundation Translation, no.* 73, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 91, no. 1, July 1953, p. 75-77.)

Grain boundary of U-12 steel was displaced with an average linear velocity of 0.10 to 0.16 mm. per hr. Tin-bronze velocity was 0.30 to 0.40 mm. per hr. Micrographs. 12 ref.

5486 On the Thermodynamics of Simple Carbides in Steel. N. S. Fastov and B. N. Finkelstein. *National Science Foundation Translation no* 77, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, no. 4, Apr. 1953, p. 677-679.)

Previously abstracted. See item no. 1134. v. 3, Jan. 1954.

5487 Scattering of X-Rays by Metals at Very Small Angles. B. M. Rovinsky and V. M. Genkin. *National Science Foundation Translation no.* 84, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, no. 4, Apr. 1953, p. 673-675.)

Previously abstracted. See item no. 1133. v. 3, Jan. 1954.

5488 An X-Ray Examination of an α (Al-Fe-Si) Ternary Compound. Keith Robinson and P. J. Black. *Philosophical Magazine*, v. 44, 7th ser., no. 359, Dec. 1953, p. 1392-1397.

Discusses results of experimental studies. Diagrams. 10 ref.

5489 The Electronic Structure of Some Body-Centered Cubic Metals. G. G. Hall. *Physical Society, Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1162-1171.

Form of energy surfaces for both standard excited state and ground state was deducted using transformation properties of a determinant wave function. Expressions thus found do not depend on any analytical approximation to wave functions nor on any arbitrary simplification of theory. Values for Li and Na were found by fitting theoretical energies to energies calculated by other methods. Tables, diagrams. 14 ref.

5490 Precipitation Processes in Copper-Iron Alloys. J. Reekie, T. S. Hutchinson, and F. E. Hetherington. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1101-1112.

At high degrees of cold working, dislocations are probably predominant factor in increasing resistance. Graphs, diagrams. 16 ref.

5491 The Temperature and Composition of the Beta = Alpha + Gamma$_2$ Eutectoid Reaction in Copper-Aluminum Alloys. D. L. Thomas and D. R. F. West. *Research (Supplement)*, v. 6, Dec. 1953, p. 61S-62S.

Includes table. 5 ref.

Books and Miscellaneous Publications

5492 Nucleation. J. H. Hollomon and D. Turnbull. Paper from PROGRESS IN METAL PHYSICS. v. IV. p. 333-388. 1953. Interscience Publishers, Inc., New York. (TA459 C35p)

Paper reviews subject of nucleation in general but particularly emphasizes rate of nucleation in reactions involving crystalline phases. Graphs, tables, diagrams. 92 ref.

5493 Gases in Metals. C. R. Cupp. Paper from PROGRESS IN METAL PHYSICS. v. IV. p. 105-173 + 1 plate. 1953. Interscience Publishers, Inc., New York. (TA459 C35p)

Paper deals with solution and diffusion of gases in soild metals; with absorption, retention, and evolution of gases by metals; and with effects upon properties of the solid metals. Tables, graphs, diagrams. 247 ref.

5494 Diffusion in Metals. A. D. Le Claire. Paper from PROGRESS IN METAL PHYSICS. v. IV. p. 265-332. 1953. Interscience Publishers, Inc., New York. (TA459 C35p)

Summarizes more important advances that have been made in understanding of diffusion processes. Diagrams, tables, graphs. 131 ref.

See also:
4814 (electrodeposited coatings on iron single crystals)
5302 (transformation behavior of steel)
5305 (transformation of steel)
5371 (effect of microstructure on creep strength)
5375 (decomposition in Al alloys)
5402 (machinability and microstructure)
5786 (primary structures of welds)

METALS—POWDER

5495* The Description and Evaluation of Different Types of Zinc Powders. (German.) H. Enzfelder. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, no. 11, Nov. 1953, p. 234-236.

Discusses classification of Zn powders according to source or grain size. Describes hydrogen evolution and its effectiveness in precipitating metallic impurities from Zn solutions. Micrographs, tables, graphs. 4 ref.

5496 Sintered Manganese Steels. F. Benesovsky and R. Kieffer. *Henry Brutcher, Altadena, Cal., Translation no.* 2974, 15 p. (From *Berg- und Hüttenmännische Monatshefte*, v. 95, no. 8, 1950, p. 145-150.)

Manganese steels of known composition, containing 2-16% of Mn and 0.2-1.6% of C, can be technically produced without difficulties by sintering method. Graphs, micrographs. 22 ref.

5497 Sintering of Tungsten Carbide-Cobalt Compositions as Surface Reaction. W. Dawihl. *Henry Brutcher, Altadena, Cal., Translation no.* 3067, 11 p. (From *Zeitschrift für Metallkunde*, v. 43, no. 1, 1952, p. 20-22.)

Studies aimed at clarification of dissimilar effect of Co, Ni, and Fe as binders upon shrinkage and sintering of WC. 7 ref.

5498 Powder Metal Applications. *Metal Industry*, v. 83, Dec. 25, 1953, p. 517-520.

Includes photographs, diagrams.

5499* Sintered Nickel-Copper Alloys. (Monel). (German.) F. Benesovsky. *Metall*, v. 7, nos. 21-22, Nov. 1953, p. 894-895.

Presents a literature review. Discusses problem of producing finished parts by powder metallurgy. Tables, micrographs. 6 ref.

5500* Properties of Iron Powder Obtained by Pulverization. (Russian.) V. I. Prosvirin and A. F. Silaev. *Vestnik Mashinostroenia*, v. 33, no. 9, Sept. 1953, p. 59-61.

Powders obtained by compressed air pulverization have better properties than those obtained by centrifugal pulverization. Graphs, table, micrographs.

5501* Heat-Resisting Materials and Cermets. (German.) Bruno Waeser. *Werkstoffe und Korrosion*, v. 4, no. 11, Nov. 1953, p. 397-399.

Presents a literature review. Discusses combination of properties that afford protection up to 1000 C. Tables, graphs. 28 ref.

Books and Miscellaneous Publications

5502 The Theory of Sintering. G. A. Geach. Paper from PROGRESS IN METAL PHYSICS. v. IV. p. 174-204 + 1 plate. 1953. Interscience Publishers, Inc., New York. (TA459 C35p)

Includes graphs, tables, diagram. 80 ref.

See also:
5086 (powder metallurgy literature)
5190 (processing of Fe powder parts)

MINING ENGINEERING

5503 Eagle Mountain Iron Ore Mine Operations. Kenneth B. Powell. *American Iron and Steel Institute, Preprint*, Nov. 6, 1953, 12 p. (TS300 Am35ta)

Covers geological history; exploration; mining method; drilling

Mining Engineering

and blasting; shovel operation; trucking; cost data; ore beneficiation; and railroad operation. Table.

5504* Relationship Between Mud Flushing and Drilling Rate in Light of Jet Drilling Experiments in Transdanubia (Hungary). (Hungarian.) Ödön Alliquander and Ferenc Patsch. *Bányászati Lapok*, v. 8, no. 12, Dec. 1953, p. 573-577.

Reviews results with various types of jet drills. Practical aspects are discussed. Graphs, photographs.

5505* The Function of the Mines Branch Radioactivity Division. E. A. Brown. *Canadian Mining and Metallurgical Bulletin*, v. 46, no. 500, p. 760-763; disc., p. 763.

Discusses work being done to promote utilization of Canadian radioactive ores. Table. 12 ref.

5506* Influence of the Macro-Heterogeneity of the Stratum on the Yield of the Well. (Russian.) V. P. Pilatovskii. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 417-420.

Discusses non-uniformity of a flat stratum formed by impenetrable additives and its effects on oil flow. Diagram, table.

5507 The Scintillation Counter in the Search for Oil. R. W. Pringle, K. I. Roulston, G. W. Brownell, and H. T. F. Lundberg. *Mining Engineering*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 196, Dec. 1953, p. 1255-1261.

Rapid improvement of airborne scintillometer and perfection of its efficiency for counting low energy γ radiation has made it possible to work out a technique to map in great detail the radiation pattern at the earth's surface. On such maps low radiation over certain areas appears to indicate the existence of oil accumulations, forming a pattern similar to that obtained by the geochemists. Graphs. 13 ref.

5508* Correlation of Oil Residuals Following Surfactant Floods. Edmundo Ojeda, Floyd Preston, and J. C. Calhoun. *Producers Monthly*, v. 18, Dec. 1953, p. 20-21, 24-29.

Oil recoveries may be effected differently from oil and water-wet systems. Indicates that removal in a specific water-wet system was accomplished with less additive material than in an oil-wet system. Tables, diagram, graphs. 4 ref.

5509* The Chemical Treatment of Drilling Muds. I. P. E. Chaney, W. F. Oxford, Jr., and Fred Chisholm. *World Oil*, v. 138, Jan. 1954, p. 107-108, 110, 112, 115-116.

Discusses behavior of clay colloids; hydration of and repulsive and attractive forces between clay particles; lime treated clays; and commonly used drilling muds. 25 ref.

See also:
4873 (radio in coal mines)

NONDESTRUCTIVE TESTING

5510* Nondestructive Materials Testing. (Dutch.) *Bedriff en Techniek*, v. 6e, no. 20, Sept. 26, 1953, p. 153-155.

Reviews testing methods using radioactive isotopes, ultrasonics, magnetism, and X-rays. Diagram, table.

5511* Mobile Engineering Radiographic Unit. *Engineer*, v. 196, Dec. 25, 1953, p. 837-838.

Discusses equipment and operating characteristics. Photographs.

5512 Cobalt 60—Inspection Uses Are Growing. D. E. Brewer. *Iron Age*, v. 172, Dec. 31, 1953, p. 80-82.

Cobalt 60 inspection in being used to detect flaws in castings and weldments subject to severe stresses; locate hidden elements in internal assemblies; and uncover internal holes and voids. Photograph, radiographs.

5513* Effects of Source and Specimen Dimensions on Resolution in Gamma Radiography. A. J. Stevens. *Nondestructive Testing*, v. 11, Nov.-Dec. 1953, p. 13-15.

A general quadratic equation is developed which expresses dispersion to be expected from a γ source in terms of geometry of exposure set-up. Curve relates specimen dimensions to source-film distance for a "standard" source. Diagram, graph, tables.

5514* Ultrasonic Inspection Using Automatic Recording and Frequency Modulated Flaw Detector. Donald C. Erdman. *Nondestructive Testing*, v. 11, Nov.-Dec. 1953, p. 27-31.

Presents requirements for complete description of internal flaws, including depth of flaw and its area. Diagrams, photographs.

5515 Sound Waves Uncover Inner Flaws. *Steel*, v. 133, Dec. 14, 1953, p. 120-121.

Describes ultransonic method of non-destructive testing particularly suited for inspection of heavy sections. Photographs.

5516* Evaluating Technical X- and Gamma-Ray Recordings in the Technique of Measuring. (German.) E. A. Müller. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 95, no. 32, Nov. 11, 1953, p. 1093-1097.

Discusses proper selection of probes for controlling quality of recordings. Different influences on photographic recordings are presented. Tables, graphs. 9 ref.

5517* Nondestructive Electronic Sorting of Metals by Their Physical Properties. (German.) H. H. Rust. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 95, no. 34, Dec. 1, 1953, p. 1158-1159.

Process is based on electrical conductivity and permeability of materials. Graphs, microphotographs. 2 ref.

See also:
5380 (stress-strain records for structural members)
5557 (industrial uses of radio isotopes)

NUCLEAR PHYSICS, NUCLEONICS, AND RADIATION

5518 Industrial Participation in the Atomic Energy Program. T. Keith Glennan. *American Scientist*, v. 42, Jan. 1954, p. 96-103.

Discusses importance of industrial interest in development of atomic energy for peaceful purposes. Stresses limitations imposed by governmental secrecy.

5519* The Delay in the Build-Up of Halogen-Quenched Counters. D. Van Zoonen. *Applied Scientific Research*, v. 3, sec. B, nos. 4-5, 1953, p. 377-389.

It is shown experimentally that the so-called delay in halogen-quenched counters is only apparent delay. Graphs, tables. 12 ref.

5520* Scintillation Counting and Its Medical Applications. W. V. Mayneord. *British Journal of Applied Physics*, v. 4, Dec. 1953, p. 353-358.

Based on paper presented at 37th Physical Society Exhibition, Apr. 1953. General description is given of main types of photomultipliers and luminescent materials suitable for such work. Photographs. 17 ref.

5521* The Dutch-Norwegian Atomic Energy Project. Gunnar Randers. *Bulletin of the Atomic Scientists*, v. 9, Dec. 1953, p. 369-371.

Describes agreement on combined project. Discusses co-operation between government and private industry, security regulations, heavy-water reactors, and conference at Kjeller.

5522 Methods and Equipment for Handling Radioactive Material. P. B. Aitken. *Chemistry in Canada*, v. 5, Dec. 1953, p. 260-262.

Paper proves of direct value to those chemists who wish to handle small amounts of radioactive material. Practical suggestions on contamination and discussion of dry boxes, fume hoods, shielding bricks, and all other necessary supplies and equipment for tracer work are given. Photographs, diagram.

5523* Magnetic Mass-Spectrometer in Combination With Wilson's Chamber. (Russian.) A. Alikhanian, V. Kirillov-Ugriumov, N. Shostakovich, and V. Fedorov. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 255-257 + 1 plate.

Describes system mounted and used at 3200 m. above sea level. Diagrams, graphs. 3 ref.

5524* Determining the Number of Slow π and μ-Mesons in Cosmic Rays at Various Altitudes. (Russian.) Kh. P.

Babaian, I. I. Zinger, and N. A. Marutian. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 263-264.

Mesons with up to 12 m.e.v. were determined with photographic plates. Tables. 2 ref.

5525* The Preparation of Large Nuclear Emulsion Detectors and Their Application to the Study of K-Mesons and Hyperons. D. Lal, Yash Pal, and B. Peters. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Oct. 1953, p. 277-287.

Method is described for constructing a detector of large vol. and stopping power which can be used for observing entire chains of successive nuclear interactions. 9 ref.

5526* Observations on τ-Mesons and on *K*-Mesons Giving Rise to Capture Stars. D. Lal, Yash Pal, and B. Peters. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Nov. 1953, p. 398-417.

Possible relations between various distinguished types of charged *K*-mesons are discussed. Tables. 12 ref.

5527* An Improved Method for Determining the Mass of Particles From Scattering *Versus* Range and Its Application to the Mass of *K*-Mesons. S. Biswas, E. C. George, and B. Peters. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Nov. 1953, p. 418-439.

A new method is developed for determining mass of particles coming to rest in nuclear emulsions. Graphs, tables. 14 ref.

5528* The Fuel Industries and Atomic Energy—Some Common Interests. J. M. Hutcheon. *Institute of Fuel, Journal*, v. 26, Dec. 1953, p. 306-311.

Among possible moderators for natural-uranium thermal-energy nuclear reactors artificial graphite is attractive because of its relative cheapness and ready availability. Photographs, table, diagram. 20 ref.

5529 Attenuation of Gamma Rays. II. Transmission Values for Various Materials and Geometries. Glenn H. Peebles. *Journal of Applied Physics*, v. 24, Dec. 1953, p. 1437-1447.

Discusses effect of variation of total absorption coefficient on γ-ray transmission probabilities. Estimates build-up factors for material of arbitrary atomic number. Graphs, tables. 2 ref.

5530* Installation of a Source of 30 C of Radiocobalt Intended for Radiochemical Research. (French.) A. Chapiro, M. Cottin, M. Haissinsky, M. Magat, and C. Vermeil. *Journal de physique et le radium*, v. 14, no. 12, Dec. 1953, p. 687-689.

Describes installation of Co^{60}, transporting and placing of source in the installation, and protection apparatus necessary for its use in radiochemistry. Diagrams.

5531 Emission of Gamma-Rays During Disintegration of μ-Mesons. G. V. Skornyakov. *National Science Foundation Translation, no* 32, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 431.)

Electrons emitted in decay of μ-mesons have high energy. Shows that probability of γ-ray emission relatively high. Graphs. 4 ref.

5532 On the Theory of Isotopic Displacement. D. Ivanenko and N. Kolesnikov. *National Science Foundation Translation*, no. 39, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 253.)

Discusses isotopic displacement of heavy elements. Graph. 7 ref.

5533 Radiative Corrections to Scattering of Electrons by Electrons. A. Akhiyezer and R. Polovin. *National Science Foundation Translation no.* 47, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 90, 1953, p. 55.)

Presents diagrams and calculations showing electron reactions. 4 ref.

5534 Absorption of Cosmic-Ray Particles Generating Electron-Nuclear Showers. S. A. Azimov, A. L. Lyubimov, and K. P. Ryzhkova. *National Science Foundation Translation, no.* 62, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 90, 1953, p. 51-54.)

Absorption of particles generating electron-nuclear showers in graphite, Fe, and Pb was measured. Diagram, table. 4 ref.

5535 Secondary Emission During Bombardment of a Metal Target by Multiple Charged Ions. Yu. A. Dunayev and I. P. Flaks. *National Science Foundation Translation no.* 72, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 91, 1953, p. 43-45.)

Discusses secondary electron emission which occurs when metal targets are bombarded by ions having various charges. Graphs.

5536 Volume Effect in the Isotope Shift in Hydrogen and Deuterium. D. D. Ivanenko and N. N. Kolesnikov. *National Science Foundation Translation, no.* 79, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 91, no. 1, July 1953, p. 47-50.)

Volume effect was calculated on supposition that nucleus reaction potential has character of a square pit. Calculations and experimental findings were in agreement. 7 ref.

5537* The Counting Loss of a Geiger Counter With Periodic Arrival Rate of Quanta. (English.) F. K. du Pré. *Philips Research Reports*, v. 8, Dec. 1953, p. 411-418.

A formula is derived for counting loss of a Geiger counter with arbitrary dead time, exposed to periodic X-radiation of arbitrary wave form. Graphs. 5 ref.

5538* The Angular Distribution of the Secondary Electrons of Soot. (English.) J. L. H. Jonker. *Philips Research Reports*, v. 8, Dec. 1953, p. 434-440.

A Ni target covered with soot was bombarded. Distribution curves were plotted. Diagrams, micrograph, table.

5539 The Nuclear Disintegrations Produced by High Energy Protons. G. C. Morrison, H. Muirhead, and W. G. V. Rosser. *Philosophical Magazine*, v. 44, 7th ser., no. 359, Dec. 1953, p. 1326-1338.

A comparison is made between nuclear disintegrations observed when 140 m.e.v. protons pass through photographic emulsions and nature of disintegrations expected on the Goldberger model. Graphs, tables. 14 ref.

5540 Paramagnetic Scattering of Neutrons by Rare Earth Oxides. W. C. Koehler and E. O. Wollan. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1380-1386.

Magnitude and angular dependence has been studied for trivalent ions in Pr_2O_3, Nd_2O_3, and Er_2O_3. Graphs. 24 ref.

5541 Magnetic Scattering of Neutrons From Rare Earth Ions. G. T. Trammell. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1387-1393.

Differential cross section for scattering of thermal neutrons by paramagnetic ions is derived theoretically. Tables, graphs. 11 ref.

5542 Uranium-235 Thermal Neutron Fission Yields. George W. Reed and Anthony Turkevich. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1473-1481.

Absolute yields of six nuclides in thermal neutron fission of U^{235} have been deterimned to better than 6%, using fission counting and radiochemical techniques. Tables, graphs, diagram. 22 ref.

5543 Decay of Ga^{66}. L. G. Mann, W. E. Meyerhof, and H. I. West, Jr. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1481-1489.

Scintillation equipment consisting of a three-crystal pair spectrometer, two-crystal Compton spectrometer, and single NaI (Tl) and anthracene crystals used in coincidence have been used to investigate decay of Ga^{66}. Tables, graphs, diagrams. 29 ref.

5544 Complex Alpha Spectra of Radiothorium (Th^{228}) and Thorium-X (Ra^{224}). Frank Asaro, Frank Stephens, Jr., and I. Perlman. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1495-1500.

The α and γ spectra of Th^{228} have been studied with an α-particle spectrograph and γ-ray scintillation counters. Graphs, tables. 20 ref.

5545 The Application of Variational Methods to Scattering by Ions. II. The Distorter Wave Approximation and the 1s-2s Excitation of Helium Ions by Electron Impact.

Nuclean Physics, Nucleonics, and Radiation

B. H. Bransden, A. Dalgarno, and N. M. King. *Physical Society, Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1097-1103.

Wave functions determined by variational methods of Hulthén and Kohn are employed in calculation of zero order partial cross section for process $He^+(1s)+e \rightarrow He^+(2s)+e$ by disorted wave, Born, and Oppenheimer approximations. 12 ref.

5546 Angular Distribution of γ-Radiation Following a Deuteron Stripping Reaction. G. R. Satchler. *Physical Society, Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1081-1092.

Cascades and a general theorem for angular distribution of *n*th radiation of a cascade are discussed. Formulae are given relating parameters to those used in channel spin formulation. 13 ref.

5547 The Multiple Scattering of 7.5 MeV Deuterons in Metals. A. Ashmore and A. V. Crewe. *Physical Society Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1172-1175.

Agreement was obtained between experimental distributions and those calculated from Moliere's theory. Diagram, table, graph. 13 ref.

5748 A Proportional-Counter Technique for Measuring X-Ray Scattering From Powders, Fibres and Liquids. U. W. Arndt, W. A. Coates, and D. P. Riley. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1009-1016.

Counter spectrometers are described for accurate semi-automatic measurement of diffracted X-ray intensity over a range of scattering angles from 0° to 130°. Diagrams, graph. 10 ref.

5549 The Penetration of Electrons Into Luminescent Material. W. Ehrenberg and J. Franks. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1057-1066.

Accounts for discrepancies in electron ranges as found in present experiments compared with those obtained by other methods. Diagrams, graphs, table. 20 ref.

5550 The Decomposition of Thin Films on Bombardment With Slow Electrons. D. A. Wright and J. Woods. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 1073-1086.

With films of alkali halides, decomposition is intensified at an energy corresponding with the first optical absorption band, having been initiated at a lower energy. Graphs, table, diagram. 29 ref.

5551 Diffraction of Light by Ultrasonic Waves. I. General Theory. II. Approximate Expressions for the Intensities and Comparison With Experiment. A. B. Bhatia and W. J. Noble. *Royal Society, Proceedings*, v. 220, ser. A, Dec. 8, 1953, p. 356-385 + 1 plate.

Includes diagram. 28 ref.

5552 A Neutron Diffraction Study of Potassium Dihydrogen Phosphate by Fourier Synthesis. G. E. Bacon and R. S. Pease. *Royal Society, Proceedings*, v. 220, ser. A, Dec. 8, 1953, p. 397-421.

Projections of distribution of atomic nuclei in potassium dihydrogen phosphate at room temperature have been obtained by Fourier synthesis of single-crystal neutron diffraction data. Diagrams, graphs, tables. 14 ref.

5553 Operation of the North American Aviation Water Boiler Neutron Source. Marlin E. Remley. *Science*, v. 119, Jan. 1, 1954, p. 21-28.

Includes photographs, graphs, table, diagram. 5 ref.

5554* Dectectors of Radiation. (English.) W. Lewis Hyde. *Spectrochimica Acta*, v. 6, no. 1, Nov. 1953, p. 9-18.

Discusses connotations arising in all branches of radiation measurements and normal experimental problems. 12 ref.

5555 New Metals in Atomic Energy. W. A. Johnson. *Steel Processing*, v. 39, Dec. 1953, p. 659-663, 666-667.

Zr, Be, and U are considered.

5556* Origin of Cosmic Rays. Radioastronomy. (Russian.) V. L. Ginzburg. *Uspekhi Fizicheskikh Nauk*, v. 51, no. 3, Nov. 1953, p. 343-392.

Discusses electron component of cosmic rays and their motion in interstellar space. Supernova and new stars are described as possible sources of rays. Tables. 55 ref.

5557 Some Industrial Applications of Radio-Isotopes. C. Croxson. *Welding and Metal Fabrication*, v. 22, Jan. 1954, p. 15-20.

Applications of radioactive isotopes depend on property of these substances to spontaneously emit radiations which can be recorded and measured. Micrographs, photographs, graph, table. 4 ref.

Books and Miscellaneous Publications

5558 Energy in the Future. Palmer Cosslett Putnam. 556 p. 1953. D. Van Nostrand Co., Inc., New York. (HC59 P98e)

A study of maximum plausible world demands for energy over the next 50 to 100 years.

See also:
4396 (mutation effects of radiation)
4567 (isotope measurement)
4587 (acid production by irradiation)
4785 (radioactive Sr to eliminate static hazard)
5203 (reactor construction)
5505 (utilization of radioactive ores)

OPERATIONS RESEARCH AND MANAGEMENT ENGINEERING

5559* Modern Conception of Warehouse of Special Steels. (English.) *Aciers Fins & Spéciaux Francais*, 1953, no. 13, Mar., p. 45-50.

Discusses organization of depots for sale of special steels in Paris. Photographs.

5560 Quality Control in the Foundry. James M. Barabee. *American Foundryman*, v. 25, Jan. 1954, p. 50-54.

Reports present program in one company. Photographs, graphs.

5561 Industry and Education. H. W. Jones. *American Iron and Steel Institute, Preprint*, Oct. 1, 1953, 9 p. (TS300 Am35ta)

Paper presented at Youngstown Regional Technical Meeting of AISI, Oct. 1, 1953.

5562* Expenditure Control Through Responsibility Accounting. T. M. McDaniel, Jr. *American Water Works Association, Journal*, v. 45, Dec. 1953, p. 1298-1308.

Primray objective of every accounting system should be to provide all levels of management in an organization with information that will aid them in more effectively controlling their costs and operations. Diagrams, tables.

5563* A Technique for Standardising Massed Batteries of Control Charts. Stafford Beer. *Applied Statistics*, v. 2, Nov. 1953, p. 160-165.

Discusses a method of keeping a large number of charts under surveillance. Describes an application to production control in a factory. Diagrams, graph.

5564* Acute Inhalation Toxicity of Beryllium. IV. Beryllium Fluoride at Exposure Concentrations of One and Ten Milligrams Per Cubic Meter. Herbert E. Stokinger, Charles J. Spiegl, Robert E. Root, Robert H. Hall, Luville T. Steadman, Catherine A. Stroud, James K. Scott, Frank A. Smith, and Dwight E. Gardner. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Dec. 1953, p. 493-506.

Pulmonary lesions were produced in animals exposed daily to BeF_2 mist at concentrations of 10 and 1 mg. per m. These resemble closely the lung changes resulting from inhalation of $BeSO_4$. Tables. 22 ref.

5565* Systematic Toxicological Analysis by Spectrophotometric Methods. I. Nonalkaloidal Organic Compounds. George W. Roche and Harold N. Wright. **II. Alkaloidal Poisons.** Eleanor Berman and Harold N. Wright. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Dec. 1953, p. 507-527.

Part I presents methods for isolation and qualitative identification by spectrophotometric means in ultraviolet range of nonalkaloidal non-volatile organic poisons usually encountered

in routine toxicological analysis. Part II describes method for preparation of extracts from tissues having a degree of purity satisfactory for spectrophotometric identification in ultraviolet range of certain members of the large group of alkaloidal poisons, with particular reference to those compounds likely to be encountered in routine toxicological analysis. Graphs, tables. 14 ref.

5566* Note on Mica Dust Inhalation. Harry Heimann, Samuel Moskowitz, C. R. Harihara Iyer, M. N. Gupta, and N. S. Mankiker. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Dec. 1953, p. 531-532.

Data are not in conformity with other reports of effects of mica dust inhalation in that in present observations cases of nodular or conglomerate fibrosis were not observed. 3 ref.

5567* Vinyl Plastics. Their Dermatological and Chemical Aspects. George E. Morris. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Dec. 1953, p. 535-539.

New plastics are being developed each year. It is necessary that the industrial physician and dermatologist know the fundamentals of chemistry of different plastics, to be able to judge correctly any case that comes to him for judgment concerning causal relationship with the work. Photograph.

5568* Synthetic Rubbers. Their Chemistry and Dermatological Aspects. George E. Morris. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Dec. 1953, p. 540-546.

Activators, accelerators, antioxidants, and plasticizers are probably all potential irritants and sensitizers. Silicone rubbers seem to be inert dermatologically. Photograph. 7 ref.

5569* Toxicity of Silica. I. Silica Solutions. Lester D. Scheel, E. Fleisher, and F. W. Klemperer. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Dec. 1953, p. 564-573.

It appears improbable that colloidal silica gel can be formed in the tissue fluids from the solution of particulate silica deposited in the tissues. Lack of demonstrable toxicity obtained with soluble silica makes it necessary to find another explanation for the toxicity of silica in tissues as manifested in silicosis. Tables, graph. 9 ref.

5570* Fluctuations of Breath Radon in Subjects Seated at Rest. E. J. Martin and J. K. W. Ferguson. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Dec. 1953, p. 574-581.

Radon content of exhaled air of subjects with abnormally high but stabilized Ra burdens was investigated. Results were expressed as curies per liter of expired air (CL) and as curies per minute (CM). A method of sampling and computing CM is described. Diagram, tables. 8 ref.

5571* Serious Poisoning by Hexachlorocyclohexane. Clinical and Laboratory Observations on Five Cases. E. Danopoulos, K. Melissions, and G. Katsas. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Dec. 1953, p. 582-587.

Through clinical and laboratory observation of five poisoned persons treated, a description of grave chronic poisoning in man by B.H.C. is provided for the first time. 7 ref.

5572 Materials Handling Has Major Role in Production of Powerflite Transmissions. Joseph Geschelin. *Automotive Industries*, v. 109, Dec. 15, 1953, p. 46-50.

Describes equipment, plant layout, and operating characteristics. Photographs.

5573 Research Is a Business. Lincoln R. Thiesmeyer. *Chemistry in Canada*, v. 5, Dec. 1953, p. 263-265.

Observes that research itself is a big and paying business. Discusses some attributes of that business.

5574* Practical Application of the New British Standard System of Limits and Fits. G. J. Pearmain. *Engineer*, v. 196, Dec. 25, 1953, p. 848-852.

Abstracted from paper presented at British Inst. of Mech. Engr., Dec. 1953. Discusses means by which new system can be most efficiently applied in industry. Graphs, table, diagram.

5575 The Engineer's Role in the Foundry. B. C. Yearley, C. W. Briggs, and W. S. Williams. *Foundry*, v. 82, Jan. 1954, p. 98-99, 238-243.

Discusses utilization of engineering talent in the industry.

5576 Materials Handling. Richard L. Speaker. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 129-132.

Reports increased interest in automation during past year. 48 ref.

5577* Mechanical Handling in the Petroleum Industry. E. A. Reynolds and V. F. H. Samson. *Institute of Petroleum, Journal*, v. 39, Nov. 1953, p. 795-814; disc., p. 814-818 + 4 plates.

Materials handling as an aid to increased productivity. Diagram, tables, photographs.

5578* A Note on Labour Turnover and the Individual Factory. Hilde Behrend. *Journal of Industrial Economics*, v. 11, no. 1, Nov. 1953, p. 58-64.

Includes tables. 10 ref.

5579* Safety in the Laboratory. III. Alec Webster. *Laboratory Practice*, v. 2, Dec. 1953, p. 655-657.

A general discussion.

5580* Testing of Application of Statistical Methods in Analysis and Control of Foundry Production. (Russian.) A. I. Antonov, P. I. Kantor, and M. S. Markin. *Liteinoe Proizvodstvo*, 1953, no. 8, Aug., p. 20-24.

Introduction of method assisted in administration and reduced spoilage. Diagram, graphs, tables. 2 ref.

5581* How Form Tolerances Affect Gaging Requirements. IV. Earle Buckingham. *Machinery*, v. 60, Jan. 1954, p. 184-190.

Shows how tolerances on form, particularly tapers, are selected and how they determine gaging requirements. Diagrams.

5582 Application of Research to an Industry Composed of Small Firms. C. N. Kington. *Metal Treatment and Drop Forging*, v. 20, Dec. 1953, p. 597-603.

Discusses means necessary to overcome financial, technical, and human problems in small firm research.

5583* Quality Control in the Paint Industry. II. Raw Materials—Acceptance and Specifications. Lawrence Shatkin. *Paint and Varnish Production*, v. 43, Dec. 1953, p. 31-32, 66.

Discusses sampling methods and testing techniques. 10 ref.

5584 Executive Training—Your Neglected Problem? II. David F. Tver. *Petroleum Refiner*, v. 33, Jan. 1954, p. 241-242, 244, 246, 259.

Discusses employer-employee relationships.

5585 University Research and Government Support. Lloyd V. Berkner. *Physics Today*, v. 7, Jan. 1954, p. 10-17.

Discusses necessity for diversity in sources of support for university research and government administration of its support. 4 ref.

5586* Transport of Radium Sulfate From the Lung and Its Elimination From the Human Body Following Single Accidental Exposures. L. D. Marinelli, W. P. Norris, P. F. Gustafson, and T. W. Speckman. *Radiology*, v. 61, Dec. 1953, p. 903-913; disc., p. 914-915.

Persons who suffered single accidental exposures to $RaSO_4$ dust were examined for exhalation of radon and for γ-ray activity from the thorax and from the body as a whole. Graphs, diagrams, table. 15 ref.

5587* Ideal Cement Co's. Research Center. G. C. Wilsnack. *Rock Products*, v. 56, Dec. 1953, p. 98-101, 124.

Costing approximtaely $500,000 the new research center of Ideal Cement Co., near the Boettcher, Colo. plant, will serve 13 plants with research studies applied to production techniques and cement uses. Photographs.

5588 Small Parts Handling. Two Part System Means Perpetual Positioning. *Steel*, v. 133, Dec. 28, 1953, p. 74-75.

Operations Research and Management Engineering

Drop-bottom box and stand feed small parts at work height in two Ford stamping plants. Results is a profitable production increase per shift on each operation. Photographs.

5589* Management of Research. *Tappi*, v. 36, Dec. 1953, p. 12A, 14A, 16A, 18A, 20A, 22A, 26A, 30A, 32A, 34A.

Symposium includes "Organization for Research", H. N. Stephens; "The Scope of Research", Frederick H. Frost; "The Stimulation of Research", Wendell W. Moyer; and "Selling Research to Management and to Labor", Milton O. Schur. 4 ref.

5590 Stop Oxyacetylene Fires. Carl Saacke and R. L. Deily. *Welding Engineer*, v. 39, Jan. 1954, p. 22-25.

Condensation of paper presented at 41st National Safety Congress, Chicago, Oct. 1953. Presents safety rules and emphasizes their importance. Graph, diagrams, photograph.

Books and Miscellaneous Publications

5591 The Methods of Statistics. L. H. C. Tippett. 4th Ed. 395 p. 1952. John Wiley & Sons, Inc., New York. (QA273 T49m4)

Chapters cover frequency distributions and measures; distributions derived from theory of probability; inference from random samples; errors in large and small samples; simple analysis and further analysis of variance; correlation and association; sampling errors in simple correlation analysis; multiple and partial regression and correlation; nonlinear regression; and problems of practical application.

See also:
5163 (safety mesaures during Mg processing)
5204 (toxicity of Be)
5283 (quality control in die casting)
5751 (statistical quality control)

PHYSICS

5592 On the Theory and Design of Acoustic Resonators. Uno Ingard. *Acoustical Society of America, Journal*, v. 25, Nov. 1953, p. 1037-1061.

Absorption and scattering from resonators in a free field as well as in walls are discussed. Graphs, tables, diagrams. 18 ref.

5593 A Study of the Factors Influencing the Damping of an Acoustical Cavity Resonator. Robert F. Lambert. *Acoustical Society of America, Journal*, v. 25, Nov. 1953, p. 1068-1083.

A systematic study of experimentally significant losses contributing to damping is presented. Graphs, tables, diagrams. 44 ref.

5594 Scattering of Underwater Plane Ultrasonic Waves by Liquid Cylindrical Obstacles. Stanley J. Bezuszka. *Acoustical Society of America, Journal*, v. 25, Nov. 1953, p. 1090-1095.

Report of a theoretical investigation of sound scattering from liquid cylindrical obstacles immersed in water. Tables, graphs, diagrams. 7 ref.

5595* Calculation of Sound Propagation in Structures. (English.) L. Cremer. *Acustica*, v. 3, no. 5, 1953, p. 317-335.

Different types of structure-borne sound waves are described and the wavelengths deduced. Discusses reduction of longitudinal and flexural wave amplitudes afforded by change of section, transition from rod to plate, corners, elastic layers, and impeding masses. Graphs, diagrams. 16 ref.

5596* The Relation Between the Sone and Phon Scales of Loudness. (English.) D. W. Robinson. *Acustica*, v. 3, no. 5, 1953, p. 344-358.

A new set of experiments is described in which a variety of sounds having known loudness level-intensity relations was used to make independent estimates of phonsone scale law over a wide intensity range. Tables, graphs. 17 ref.

5597* The Directivity of Spherical Microphones. (English.) R. L. Pritchard. *Acustica*, v. 3, no. 5, 1953, p. 359-362.

An existing solution for sound field radiated from a vibrating spherical cap was used to calculate directional response of a cylindrical microphone mounted in a sphere. Graphs. 12 ref.

5598* Electrical and Galvanomagnetic Properties of Chromium Sulfides. (Russian.) N. P. Grazhdankina and I. G. Fakidov. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 429-430.

Describes investigation of electrical resistance of chromium sulfides at low temperatures. Graphs.

5599* The Theory of Relationship of Spontaneous Magnetization on Temperature in the Low Temperature Region. (Russian.) E. Kondorskii and A. Pakhomov. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 431-434.

Attempts were made to establish theoretical relationship for a weakly conducting ferromagnetic lattice. 11 ref.

5600* Thermo-Electron Emission of Thin Layers of Thorium Oxide and Thorium on Molybdenum. (Russian.) A. R. Shul'man and A. P. Rumiantsev. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 455-458.

Emission current at various temperatures and at various degrees of cathode activation was measured. Results show that thin oxide layers are reduced to pure Th even under short activation, Table, graphs. 5 ref.

5601* Concerning the Plane Problem in Bodies Composed From Parts With Various Elastic Constants. (Russian.) S. E. Birman. *Doklady Akademii Nauk SSSR*, v. 93, no. 6, Dec. 21, 1953, p. 989-992.

Theoretical presentation.

5602* The Theory of Diffraction on a Reflecting Lattice. (Russian.) L. N. Deriugin. *Doklady Akademii Nauk SSSR*, v. 93, no. 6, Dec. 21, 1953, p. 1003-1006.

Presents analytical formulas giving distribution of fields. Graphs.

5603 The Meaning of the Vector Laplacian. Parry Moon and Domina Eberle Spencer. *Franklin Institute, Journal*, v. 256, Dec. 1953, p. 551-558.

9 ref.

5604* The Structure and Optical Behaviour of Iridescent Crystals of Potassium Chlorate. C. V. Raman and D. Krishnamurti. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Oct. 1953, p. 261-270 + 8 plates.

Includes photographs.

5605* Energy Response of Some Inorganic Scintillators. Ved Prakash Duggal. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Oct. 1953, p. 320-326.

Study of some inorganic silicate scintillators shows that they resemble organic crystals in their nonlinear energy response. Graph, table. 10 ref.

5606* Means of Controlling the Sensitivity and Determining the Frequency and Amplitude Characteristics of Seismographic Receiving Channels With the Help of the Magnetoelectric Generator. (Russian.) N. E. Fedoseenko and G. V. Groshevoi. *Izvestiia Akademii Nauk SSSR, Seriia Geofizicheskaia*, 1953, no. 5, p. 424-428 + 1 plate.

Reception of sinusoidal shaped stress was made where ratio of amplitude to frequency remained constant. Photograph, oscillograms, seismograms, diagram. 4 ref.

5607 Dielectric Properties of Hydrogen Halides. I. Hydrogen Bromide. Norman L. Brown and Robert H. Cole. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1920-1926.

Static dielectric constants of solid hydrogen bromide have been measured from 186 to 70 K and dispersion and loss below 89 K in the frequency range 15 cycles to 5 Mc. Tables, graphs. 17 ref.

5608 The Mean Amplitudes of Thermal Vibrations in Polyatomic Molecules. II. An Approximate Method for Calculating Mean Square Amplitudes. Yonezo Morino, Kozo Kuchitsu, Akira Takahashi, and Keji Maeda. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1927-1933.

Includes tables. 11 ref.

5609 Infrared and Raman Spectra of Tetramethylmethane-d_{12}. E. R. Shull, T. S. Oakwood, and D. H. Rank. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 2024-2029.

In order to study further molecular vibrations of tetra-

methylmethane and of hydrocarbons in general, tetramethylmethane-d_{12} was synthesized and its Raman and infrared absorption spectra were obtained. Tables, micrographs, graphs. 18 ref.

5610 The Quantum Mechanics of Collisions Between Diatomic Molecules. C. F. Curtiss. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 2045-2050.

Quantum mechanics of collisons between diatomic molecules is discussed. Explicit expressions for angular transition probabilities are obtained. 4 ref.

5611 The Statistical Mechanical Theory of Transport Processes. VI. A Calculation of the Coefficients of Shear and Bulk Viscosity of Liquids. Robert W. Zwanzig, John G. Kirkwood, Kenneth F. Stripp, and Irwin Oppenheim. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 2050-2055.

Includes tables. 5 ref.

5612 On the Theory of the Virial Development of the Equation of State of Monoatomic Gases. R. J. Riddell, Jr. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 2056-2064.

Problem of condensation of a gas is intimately related to asymptotic behavior of virial coefficients, Bm, as $m \rightarrow \infty$. Problem of evaluation of virial coeffiicents may be divided into two parts. Table. 21 ref.

5613 Numerical Evaluation of the Mie Scattering Functions; Table of the Angular Functions π_n and τ_n of Orders 1 to 32, at 2.5° Intervals. Frank T. Gucker, Jr. and Stanley H. Cohn. *Journal of Colloid Science,* v. 8, Dec. 1953, p. 555-574.

Discusses wave scattering from spheres. Presents mathematical results. Tables. 17 ref.

5614 Recent Developments in Applied Optics. A. C. G. Menzies. *Journal of Scientific Instruments,* v. 30, Dec. 1953, p. 441-452; disc., p. 452.

Illustrates breadth of application of optics and considerable progress which has been made. Photographs, diagrams, graphs, micrographs.

5615 A Study of Electron Emission During the Stripping of a Layer of a High Polymer From Glass in a Vacuum. V. V. Karasev, N. A. Krotova, and B. V. Deryagin. *National Science Foundation Translation, no.* 28, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 777.)

Experiment was done with a film of a benzyl cellulose preparation formed on glass. Diagrams, photographs. 4 ref.

5616 Line-Wdith of Rayleigh Scattering in Gases. I. I. Sobelman. *National Science Foundation Translation, no.* 34, July 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 653.)

Presents a detailed quantum-mechanical study of scattering by a single molecule in cases of radiation and pressure damping. 6 ref.

5617 On the Infrared Sensitivity of Copper-Oxide Photocells Prepared Under Reduced Pressure in the Field of a High-Frequency Induction Heater. A. I. Andrievsky and A. L. Rvachyov. *National Science Foundation Tranlation, no.* 35, July 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 245.)

Studies of process of oxidation of Cu under reduced pressure showed that, depending on pressure, high-frequency gas discharge has quite an appreciable effect on oxidation process. Graphs.

5618 The Elimination of Dependent Coordinates in the Theory of Vibration of Polyatomic Molecules. L. S. Mayants. *National Science Foundation Translation, no.* 37, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 423.)

Dependent coordinates were introduced in addition to independent ones in order to take advantage of symmetry of the molecules.

5619 A Boundary-Value Problem for the Telegraphist's Equation. A. G. Babukov. *National Science Foundation Translation, no.* 40, July 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 635.)

Discusses problems occurring in theory of depth pumps.

5620 The Method of Regularization and the Theory of Particles With Arbitrary Spin. V. I. Karpman. *National Science Foundation Translation, no.* 43, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 257.)

Discusses application and disadvantages. 7 ref.

5621 On the Theory of the Compound Etalon (Multiplex). F. A. Korolev. *National Science Foundation Translation, no.* 49, Aug. 1953, 2 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 651-652.)

Discusses operation and results obtained.

5622 Reflection Spectra of Ordinary and Devitrified Lead Glasses in the Infrared. V. A. Florinskaya. *National Science Foundation Translation, no.* 50, Aug. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 261-264.)

It was shown that all glasses with a PbO content up to 50% have a second main absorption band in the vincinity of 13 μ, corresponding to the main internal inactive oscillation of atoms in the SiO_4 tetrahedron. Graphs. 4 ref.

5623 Diffraction of X-Rays in Bent Crystals. Kinematic Theory for the Case of Transmission and Reflection. I. B. Borovsky and P. A. Bezirganyan. *National Science Foundation Translation, no.* 55-56, Aug. 1953, 8 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 639-642, 769-772.)

Reports results developed on bsais of kinematic theory of X-ray interference for general case of a three-dimensional bent crystal. Graphs. 3 ref.

5624 Self-Oscillations in Essentially Nonlinear Quasi-Conservative Systems. G. V. Savinov. *National Science Foundation Translation, no.* 60, July 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 995-997.)

Studies were made of self-oscillations in isolated strongly nonlinear systems containing such elements as condensers with barium titanate dielectrics or self-inductances with Permalloy cores. 7 ref.

5625 Infrared Absorption Spectrum of Liquid Water in the 3200 to 3600 Cm^{-1} Region. S. N. Andreyev and T. G. Balicheva. *National Science Foundation Translation, no.* 66, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 149-151.)

Presents a detailed study of absorption band. Graph, table. 13 ref.

5626 Absorption of Light and Dielectric Constant of Alkali Halide Crystals. A. A. Vorobyov. *National Science Foundation Translation, no.* 67, Sept. 1953, 2 p. (Original in *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 157-158.)

Width of forbidden energy gap in crystals can be determined from absorption spectrum. Graphs.

5627 An Optical Method for the Study of the Silicon Organic Hydrocarbons, Raman Spectra of Alkenylsilanes. Yu. P. Yegorov and P. A. Bazhulin. *National Science Foundation Translation no.* 69, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 647-650.)

Discusses frequencies and intensities of the lines of nine silicon hydrocarbons. Table. 10 ref.

5628 Strong Perturbations of Natural Electromagnetic Oscillations in Nearly Cylindrical Regions. Yu. S. Sayasov. *National Science Foundation Translation, no.* 78, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 163-166.)

Studies were made of effect of small deformations of the side walls of long perfectly conducting cylindrical resonators on natural electromagnetic oscillations. 7 ref.

5629 An Interpretation of Vibration Spectra and Computation of the Potential Energy Parameters of Deuteroethylenes. L. M. Sverdlov and N. L. Pakhomova. *National Science Foundation Translation, no.* 80, Sept. 1953, 4 p.

Physics

(Original in *Doklady Akademii Nauk SSSR*, v. 91, no. 1, July 1953, p. 51-54.)

By using frequency relationship of uneven vibrations proposed by Arnett and Crawford calculations were made of force coefficients corresponding to uneven vibrations. Tables. 8 ref.

5630 Concerning the Use of the Fabry-Perot Interferometer for Wave-Number Measurement in the Infrared. Joseph H. Jaffe. *Optical Society of America, Journal*, v. 43, Dec. 1953, p. 1170-1173.

Effects of finite height of spectrometer slit and finite aperture of condensing lens on visibility of the spectra are discussed. Graphs, diagrams.

5631 Absorption of Millimeter Waves in Dielectric Solids. W. L. Brooks, J. H. Creig, C. Pine, W. G. Zoellner, and J. H. Rohrbaugh. *Optical Society of America, Journal*, v. 43, Dec. 1953, p. 1191-1194.

Harmonics of the 3J31 magnetron (12.5-mm fundamental wave length), dispersed by an echellette grating, are used to measure complex index of refraction for polystyrene, Plexiglas, and high melting paraffin. Diagrams, table. 7 ref.

5632* Some Remarks About the So-Called Crova Wavelength. (English.) W. de Groot. *Philips Research Reports*, v. 8, Dec. 1953, p. 401-410.

Definition with aid of Planck's or Wein's radiation formula is given. Table, graphs. 7 ref.

5633* The Manganese Emission in ABF_3 Compounds. (English.) H. A. Klasens, P. Zalm, and F. O. Huysman. *Philips Research Reports*, v. 8, Dec. 1953, p. 441-451.

Fluorescence of phosphors activated with divalent Mn is a result of electronic transitions of the activator ion itself. Table, diagram, graphs. 26 ref.

5634 The Cerenkov Effect and the Dielectric Constant. S. M. Neamtan. *Physicla Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1362-1367.

Quantum-mechanical theory of Cerenkov radiation is developed wherein refractive medium is treated not as a continuum but as an aggregation of atoms. 6 ref.

5635 Calculating of the Cohesive Energy of Diamond. L. A. Schmid. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1373-1379.

Calculation shows that binding energy for a diamond is analogous to that for hydrogen molecule. 10 ref.

5636 Thermal Decay of the Luminescence of KBr. G. W. Williams, S. R. Usiskin, and A. J. Dekker. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1398-1402.

KBr, excited by X-rays, has been investigated over a temperature range between −77 and 250 C. Diagrams, graphs. 6 ref.

5637 Anelasticity of Quartz. Richard K. Cook and Robert G. Breckenridge. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1419-1423.

Piezoelectric effect was used to measure the Q and the series electric resistance. Graphs, table. 6 ref.

5638 One-To-Two Millimeter Wave Spectroscopy. III. NO and DI. C. A. Burrus and Walter Gordy. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1437-1439.

Pure rotational transitions of $N^{14}O^{16}$ and DI^{127} have been measured in the one-to-two millimeter wave region. Tables, oscillograms. 8 ref.

5639 The Dissociation of H_2+ by Electron Impact. Edward H. Kerner. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1441-1447.

Discusses collision (Born approximation) in which the molecule is raised from ground state to lowest lying repulsive state. Graphs. 10 ref.

5640 Theory of the Microwave Zeeman Effect in Atomic Oxygen. A. Abragam and J. H. Van Vleck. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1448-1455.

A mathematical discussion of the case which has four 2p electrons outside of closed shells. Tables. 14 ref.

5641 Nuclear Quadrupole Coupling in the Li_2 Molecule. R. M. Sternheimer. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1460-1468.

Effect of quadrupole moment induced in the 1*s* shell has been investigated for several wave functions. Graph. 16 ref.

5642 Equivalent Mass and Other Effects of a Nonlocal Electromagnetic Field in Interaction With a Constant *E*, *H* Field. Christopher Gregory. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1554-1557.

Some consequences of interaction of a non-local photon with a constant E, H field are considered. 4 ref.

5643 The Physical Basis of Gravitation. Robert L. Kirkwood. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1557-1562.

Results of relativistic gravitational theory are deduced directly from elementary physical principles by use of the interpretation that gravitational field is an ether flow. Diagrams.

5644 Note on the Spin Paramagnetism of a Free Electron Gas. N. H. March and B. Donovan. *Physical Society, Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1104-1108.

Effect of exchange on spin paramagnetism of a free electron gas is discussed. Graph, table. 9 ref.

5645 Properties of the Hydrogen Molecular Ion. II. Photo-Ionization From the $1s\sigma_g$, $2s\sigma_g$ and $3s\sigma_g$ States. III. Oscillator Strengths of the $1s\sigma_g$-$2p\pi_u$, $2p\sigma_u$-$3d\pi_g$ and $2p\pi_u$-$3d\pi_g$ Transitions. R. D. Bates, R. T. S. Dralings, S. C. Hawe, and A. L. Stewart. *Physical Society, Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1113-1128.

Discusses electronic wave functions transition, matrix elements, and cross sections for fixed nuclei. Tables, graphs. 25 ref.

5646 A Scalar Representation of Electromagnetic Fields. H. S. Green and E. Wolf. *Physical Society, Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1129-1137.

It is shown that in a region which is free of currents and charges, any electromagnetic field may be rigorously derived from a single, generally complex scalar wave function. 7 ref.

5647 Vibrational Transition Probabilities of Diatomic Molecules. I. and II. P. A. Fraser and W. R. Jarmain. *Physical Society, Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1145-1157.

Part I presents approximation of integrals of electronic spectra of diatomic molecules. Part II presents two improvements in calculating vibrational overlap integrals. Tables. 15 ref.

5648 The Magnetic Moments of Spin ½ Nuclei. R. J. Blin-Stoyle. *Physical Society, Proceedings*, v. 66, no. 408A, Dec. 1953, p. 1158-1161.

It is shown that deviations of the magnetic moments of all spin ½ nuclei from Schmidt limits can be adequately accounted for by simple interconfigurational mixing. 7 ref.

5649 Photoelectromagnetic and Photoconductive Effects in Lead Sulphide Single Crystals. T. S. Moss. *Physical Society, Proceedings*, v. 66, no. 408B, Dec. 1953, p. 993-1002.

Optical acitvation energy is 0.41 e.v. Concludes that thermal activation energy is very close to this value. Graphs. 10 ref.

5650* Stability of Motion in a Finite Time Interval. G. V. Kamenkov. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 529-540.

Presents a definition of stable and unstable motion different from Liapunov's.

5651* Theory of Convective Phenomena in a Binary Mixture. (Russian.) I. G. Shaposhnikov. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 604-606.

Describes and discusses basic equations for gravitational-temperature phenomena. 3 ref.

5652* Complex Stress Functions in the Axisymmetrical Contact Problem in the Elasticity Theory. (Russian.) N. A. Rostovtsev. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 5, Sept.-Oct. 1953, p. 611-614.

Method of calculation of stress and displacement fields in absence of friction and adhesive forces. 4 ref.

5653 An Apparatus for Aperture-Response Testing of Large Schmidt-Type Projection Optical Systems. D. J. Parker, S. W. Johnson, and L. T. Sachtleben. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Dec. 1953, p. 721-730.

Presents description of apparatus and operating characteristics. Diagrams, photographs, oscillogram. 4 ref.

5654 Theory of Line-Breadth Phenomena. E. Arnous and W. Heitler. *Royal Society, Proceedings*, v. 220, ser. A, Dec. 8, 1953, p. 290-310.

A general and exact formalism is developed that permits calculation of line shape in all line-breadth phenomena, in principle to any order of approximation. Expansions for line breadth and numerator occurring in line-shape formula are given. 9 ref.

5655* Concerning the Non-Local Fields and the Nature of "Elementary" Particles. (The Dynamically Deforming Form-Factor). (Russian.) M. A. Markov. *Uspekhi Fizicheskikh Nauk*, v. 51, no. 3, Nov. 1953, p. 317-341.

Non-local free field can change into a local field. Transformation cannot occur in case of interacting non-local fields. 11 ref.

5656* Phase Composition and Certain Ferromagnetic Properties of Manganese-Zinc Ferrites. (Russian.) N. A. Toropov, L. I. Rabkin, E. Zh. Freidenfel'd, and B. Sh. Epshtein. *Zhurnal Prikladnoi Khimii*, v. 26, no. 9, Sept. 1953, p. 982-990.

Describes chemical, microscopic, X-ray, and magnetic studies of synthesized ferrites. Tables, diagrams, graphs. 9 ref.

Books and Miscellaneous Publications

5657 The Stability of Rotating Liquid Masses. R. A. Lyttleton. 147 p. 1953. Univ. Press, Cambridge, England. (QB410 L99s)

Chapters cover stability; spherical form; spheriodal and ellipsoidal harmonic analysis; further properties of Lamé functions and application to gravitation; secular stability of the Maclaurin spheroids; secular stability of the Jacobi ellipsoids; ordinary stability of the Jacobian ellipsoids; and cosmoganical implications.

5658 (Technological Electrodynamics. v. I. The Mathematics of Magnetic Fields.) **Technische Elektrodynamik. Band I. Berechnung magnetischer Felder.** Franz Ollendorff. 432 p. 1952. Springer-Verlag, Vienna. (QC761 OL4b)

Deals with a multiplicity of problems on magnetism of importance to the designer and engineer in various branches of electric industry and research. Using only functions which are readily accessible in tabular form, author demonstrates efficiency of mathematical method by his field calculations of synchronous and asynchronous motors; leakage theory of autotransformers; determination of tractive forces of split-pole systems, etc. Graphs, charts, tables, diagrams. 26 ref.

See also:
4306 (Mach 2 problem: violent controls)
4428 (infrared transparent glass)
4430 (magnetization in ferrites)
4444 (transmission spectra of glass films)
4445 (dielectric constants of ceramics)
5133 (twist of elastic prisms)
5673 (acoustics and plastics)

PLASTICS

5659 Low-Pressure Laminates. Richard Wood. *Automobile Engineer*, v. 43, Dec. 1953, p. 541-549.

Physical properties, design considerations, molding methods, and resin-impregnated asbestos-fiber and glass-fiber materials are discussed. Table, diagrams, photographs.

5660 Structural Plastics for Advanced Types of Aircraft. Domonick Rosato. *Automotive Industries*, v. 110, Jan. 15, 1954, p. 48-51, 162, 164.

Condensed from paper presented at 1953 Annual Meeting of the ASME. Graphs, table.

5661 The Silvering of Plastics. Kenneth S. Low. *British Plastics*, v. 26, Dec. 1953, p. 457-460.

Discusses techniques, equipment ,and materials used in process. Describes lacquer undercoats and top coats; lacquering operations; sensitizing and silvering solutions; application of silver; drying; and final lacquering. Diagrams.

5662 The Stability of Resin Emulsions. L. A. Munro and F. H. Sexsmith. *Canadian Journal of Chemistry*, v. 31, Dec. 1953, p. 1189-1194.

Accelerated settling tests were made on dilute polyvinyl acetate emulsions in the presence of increasing concentrations of electrolyte. Graphs, table. 10 ref.

5663 More Plastics From Petroleum. E. E. McSweeney and E. L. Kropa. *Chemical and Engineering News*, v. 32, Jan. 4, 1954, p. 27-28.

Petroleum as raw material for many aromatic derivatives.

5664* Basic Criteria for Evaluating Some Plastic Materials of Construction. Raymond B. Seymour. *Corrosion*, v. 10, Jan. 1954, p. 37-47.

Discusses atomic composition, resistance to corrosives, techniques for use, and some principal users. Tables, graph. 7 ref.

5665* Structure of Polyvinyl Alcohol. (Russian.) E. I. Barg and N. N. Mel'teva. *Doklady Akademii Nauk SSSR*, v. 92, no. 2, Sept. 11, 1953, p. 307-310.

Experiments on mechanical deformation of crystals over a wide temperature interval and electrograph analysis of X-ray difraction. Graphs, table. 7 ref.

5666* Destructive Stresses During Deformation by Torsion of an Isotropic Material. (Russian.) F. P. Rybalko and V. K. Farafonov. *Doklady Akademii Nauk SSSR*, v. 93, no. 4, Dec. 1, 1953, p. 651-654.

Tests were made on Plexiglas specimens. Micrographs. 5 ref.

5667 Polymerization of Fluorinated Ethylenes. Roy J. Plunkett. *Engineering Experiment Station News (Ohio State University)*, v. 25, Dec. 1953, p. 5-9.

Production processes and applications are briefly described. 53 ref.

5668 The Thermal and Dielectric Properties of Crystalline Long-Chain Acetates. R. J. Meakins and Joan W. Mulley. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1934-1939.

Investigation deals with normal long-chain acetates with 18, 20, 24, and 28 carbon atoms. Graphs, tables. 14 ref.

5669* Solubility and Molecular Size Distribution of Crosslinked Polystyrene. A. Charlesby. *Journal of Polymer Science*, v. 11, Dec. 1953, p. 513-520.

Includes graphs.

5670* Swelling Properties of Polystyrene Crosslinked by High Energy Radiation. A. Charlesby. *Journal of Polymer Science*, v. 11, Dec. 1953, p. 521-529.

Includes graphs. 5 ref.

5671* Polymeric Chain Transfer Reactions. Polymerization of Some Vinyl Monomers in the Presence of Vinyl Polymers. Robert A. Hayes. *Journal of Polymer Science*, v. 11, Dec. 1953, p. 531-537.

Includes graph, tables. 13 ref.

5672* Configuration and Optical Activity of Vinyl Polymers. H. L. Frisch, C. Schuerch, and M. Szwarc. *Journal of Polymer Science*, v. 11, Dec. 1953, p. 559-566.

Includes diagrams, tables. 8 ref.

5673* Acoustics and Plastics. (German.) Hermann Oberst. *Kunststoffe*, v. 43, no. 11, Nov. 1953, p. 446-454.

Discusses application of plastics to electro-acoustics; shock- and vibration-damping; room and building acoustics; and noise suppression. Photographs, diagrams, graphs. 17 ref.

Plastics

5674* Crystallization Phenomena in Plastics. (German.) Ernst Jenckel. *Kunststoffe*, v. 43, no. 11, Nov. 1953, p. 454-461.

Discusses phenomena in various plastics and rubbers. Graphs, tables, diagrams, micrographs. 15 ref.

5675* Recent Experiences in the Construction of Extruder Heads and Dies. (German.) Alfred Romanowski. *Kunststoffe*, v. 43, no. 11, Nov. 1953, p. 477-481.

Tubing heads, crossheads, blow-extruders and wide slit dies are discussed with reference to present state of development in Germany. Photographs, diagrams.

5676* Feeding and Heating of Screw-Type Presses. (German.) H. Reifenhäuser. *Kunststoffe*, v. 43, no. 11, Nov. 1953, p. 482-485.

Principles are discussed. Describes design of hopper bottom and various heating problems. Diagrams, graphs, photograph.

5677* Polyethylene Carboys. A Report on the Physical and Chemical Properties of Blow-Molded Carboys, With Permeability Data. J. H. Parliman. *Modern Packaging*, v. 27, Jan.. 1954, p. 133-138.

New, single closure, blow-molded, polyethylene bottles are used for chemicals. Tables, photographs.

5678 Trends in Materials Use. *Modern Plastics*, v. 31, Jan. 1954, p. 65-80, 157-158, 160-162, 164-165, 167-168, 171.

Phenolics, acrylics, polystyrene, cellulosics, nylon, urea, melamine, vinyl chloride, and polyethylene are discussed. Tables, charts.

5679 The Year 1953 in Review. *Modern Plastics*, v. 31, Jan. 1954, p. 117-118, 120, 122, 124, 126, 128, 130-133, 189-192, 195-196, 198, 201.

Reviews progress in production, applications, new products, and improvements in the plastics industry. Tables, photographs. 541 ref.

5680* Latest Developments in Use of Plastic Materials of Construction. Raymond B. Seymour and Martin H. Smith. *Paper Trade Journal*, v. 137, Dec. 18, 1953, p. 33-34, 36.

Describes use of plastics in digester linings, blow bits, pipes, and bleaching equipment in pulp mills. Photographs.

5681* Polyester Glass Fiber Materials. (Dutch.) R. J. Schleiekelmann. *Plastica*, v. 6, no. 11, Nov. 1953, p. 484-487.

Discusses requirements, choice of materials, and factors to be considered when used as a substitute for wood or metal construction. Photographs.

5682* Reactive Intermediary Products in Polymerization Reactions. (Dutch.) G. Salomon. *Plastica*, v. 6, no. 11, Nov. 1953, p. 506-508.

Complexity of ionic reactions due to interaction of labile intermediary product and the solvent is discussed.

5683 The Development of Plastics Extrusion. H. D. Brett. *Plastics*, v. 18, Dec. 1953, p. 406-407, 423.

A survey, with particular reference to PVC.

5684 Problems and Trends in Modern Screw Extruders for Thermoplastic Materials. E. Gaspar and G. Rowe. *Plastics*, v. 18, Dec. 1953, p. 408-409, 439.

Covers mechanical constructional details and screw design. Graph.

5685 Materials for Extrusion. *Plastics*, v. 18, Dec. 1953, p. 418-423.

Notes on some special techniques called for in extrusion of plastics materials. Include table of improtant properites of various commercially available compounds. Table.

5686 Table of Important Extrusion Compounds and Their Properties. *Plastics*, v. 18, Dec. 1953, p. 424-425.

Data sheet.

5687 Applications of Extrusions. *Plastics*, v. 18, Dec. 1953, p. 426-436.

A survey of products of an important and growing branch of the plastics industry. Photographs.

5688 Copolymers. II. The Formulation of Thermoplastic Materials by Copolymerization. A. E. Lever. *Plastics*, v. 18, Dec. 1953, p. 445-448.

Review of some important materials capable of copolymerization, with extensive technical literature and patent references. Tables. 88 ref.

5689* Economical Finishing With Vacuum Metalizing. George W. Carr. *Plastics Industry*, v. 11, Dec. 1953, p. 18-22, 25.

Discusses equipment, techniques, applications, and advantages. Photographs.

5690 Branch-Chain Detection in Butadiene-Styrene Copolymers. D. S. Fensom. *Research (Supplement)*, v. 6, Dec. 1953, p. 63S-64S.

Includes graphs. 5 ref.

5691* Modern Production and Control Equipment for Rubber and Plastics. (French.) Pierre Korda. *Revue générale du caoutchouc*, v. 30, no. 12, Dec. 1953, p. 689-875.

Describes mixing, processing, and various other equipment recently built in Switzerland and Germany. Photographs.

5692* Creep in Thermplastics. (French.) Jean Lesavre. *Revue générale du caoutchouc*, v. 30, no. 12, Dec. 1953, p. 906-914.

Discusses general creep problems. Experimental study was made of several thermoplastics including rigid and plasticized polyvinyl chlorides. Diagrams, graphs. 5 ref.

5693* Vacuum Forming of Polystyrene Sheet. John M. Hoy. *SPE Journal*, v. 10, Jan. 1954, p. 9-10, 33.

Advantages which vacuum forming offers are low tooling cost, versatility of equipment, and ability to mold large-area thin-section parts. Photographs.

5694* Thermal Degradation of Polymers During Molding. I. Theoretical Considerations. H. L. Frish and V. T. Stannett. *SPE Journal*, v. 10, Jan. 1954, p. 16-17.

Extent of degradation due to heating is discussed. Table, graph.

5695* Investigation of Mechanical Properties of Crystalline Polymers. IV. Natural Crystalline Rubber. (Russian.) V. A. Kargin and T. I. Sogolova. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 9, Sept. 1953, p. 1325-1329.

Deformtaion mechanism of crystalline rubber was analyzed. Graphs, tables. 5 ref.

See also:

4308 (design of plastic radomes)
4443 (glass fabric and its application in the plastic industry)
4590 (telomeric reactions of ethylene and alcohols)
4606 (perchlorvinyl solutions)
4686 (polymerization of rapeseed oil)
5567 (determination and chemical aspects of vinyl plastics)

POLLUTION AND WASTES

5696* Utilization of Salt Residues and Scrapings Arising During the Processing of Light Metals and Light Metal Scrap. (Hungarian.) András Domony. *Aluminium (Budapest)*, v. 5, no. 12, Dec. 1953, p. 245-247.

Reports investigations to determine quantity of valuable materials lost in salt residues and scrapings. Proposes method for recovery. Describes composition of waste material. Tables.

5697 The Use of Steel Plant Byproducts. E. H. Rose and J. Forrest Kimball. *American Iron and Steel Institute, Preprint*, Oct. 21, 1953, 14 p. (TS300 Am35ta)

Paper presented at the Birmingham Regional Technical Meeting of AISI, Oct. 21, 1953.

5698 Recovery of Manganese in Steel Mill Operations. E. C. Wright. *American Iron and Steel Institute, Preprint,* Oct. 21, 1953, 23 p. (TS300 Am35ta)
Paper presented at Birmingham Regional Technical Meeting of AISI, Oct. 21, 1953. Diagrams, tables.

5699* Findings and Recommendations on Underground Waste Disposal. Task Group Report. *American Water Works Association, Journal,* v. 45, Dec. 1953, p. 1295-1297.
Findings, conclusions, and recommendations of report presented on May 14, 1953, at the Annual Conference, Grand Rapids, Mich.

5700 Blast Furnace Flue Dust Thickeners. J. D. Walker and E. N. Hower. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 57-61.
Method of reducing total suspended solids in overflow. Drawings, table, photographs.

5701 Smoke, Dust, Fumes Closely Controlled in Electric Furnaces. R. S. Coulter. *Iron Age,* v. 173, Jan. 14, 1954, p. 107-110.
Better working conditions, improved community relations, and lower maintenance costs have resulted from use of improved smoke control equipment on electric furnaces operated by Bethlehem Pacific Coast Steel Corp. at Los Angeles. From 12,000 to 20,000 lb. of dust are collected daily. Photographs, graphs, diagram, oscillograph, table.

5702* How Dangerous Is Rock Dust? (Swedish.) Torbjörn Karlén. *Jernkontorets Annaler,* v. 137, no. 10, 1953, p. 744-752.
Advocates continuous supervision of the dust problem with standardized methods and equipment. Diagrams. 5 ref.

5703* The Dust Problem in Rock Drilling. (Swedish.) Torbjörn Karlén. (Swedish.) *Jernkontorets Annaler,* v. 137, no. 10, 1953, p. 753-761.
Different methods of alloying dust are discussed. Diagrams. 6 ref.

5704 Contaminated Fogs. N. Pilpel. *Research,* v. 6, Dec. 1953, p. 481-485.
Atmospheric pollution is being actively tackled. An outline of techniques employed is given. Graph, photograph, micrographs. 14 ref.

5705* Use of the Heat Pump for Digester Heating. George S. Smith and James A. Morris, Jr. *Sewage and Industrial Wastes,* v. 25, Dec. 1953, p. 1369-1378.
Sewage sludge disposal with an electrically operated heat pump. Graphs, photographs, diagram.

5706* Research on Activated Sludge. II. Experiments With Brush Aeration. A. Pasveer. *Sewage and Industrial Wastes,* v. 25, Dec. 1953, p. 1397-1404.
Investigates possibility of improving oxygenation of water. Diagrams, tables, photograph. 9 ref.

5707* Water Supply and Pollution Control. Richard D. Hoak. *Sewage and Industrial Wastes,* v. 25, Dec. 1953, p. 1438-1449.
Comprehensive surveys provide a satisfactory method for control of pollution in the public interest. Table. 22 ref.

5708* Recovery of Polluted Streams. C. J. Velz. *Water & Sewage Works,* v. 100, Dec. 1953, p. 495-500; disc., p. 500-501.
Purification capacity of a stream can be determined and used to forecast the effect of pollution. Graphs, table.

See also:
4491 (dewatering of sewage sludge)
4533 (method for determining oil content in waste water)
4994 (disposition of NH_3 liquor in gas manufacture)
5291 (dust collectors to prevent air pollution)

RUBBER AND ELASTOMERS

5709* Concerning the Protection of Rubbers From Ozone Cracking. (Russian.) Iu. S. Zuev. *Doklady Akademii Nauk* SSSR, v. 93, no. 3, Nov. 21, 1953, p. 483-486.
Compression in surface layer considerably increased resistance to ozone cracking. Tables, graph. 14 ref.

5710* Mechanical Activation of the Oxidation of Vulcanized Rubbers During Static and Repeated Deformations. (Russian.) A. S. Kuz'minskii and L. I. Liubchanskaia. *Doklady Akademii Nauk SSSR,* v. 93, no. 3, Nov. 21, 1953, p. 519-522.
Action of static and dynamic deformations on oxidation and destruction of various rubber structures was studied. Tables, graphs. 5 ref.

5711* Problem of Fatigue of Rubbers. (Russian.) G. L. Slonimskii, V. A. Kargin, G. N. Buiko, E. V. Reztsova, and M. L'iuis-Riera. *Doklady Akademii Nauk SSSR,* v. 93, no. 3, Nov. 21, 1953, p. 523-526.
Breaks of chain molecules occurred in course of polyisobutylene deformation and chemically active free radicals were formed. Table, graph. 3 ref.

5712 Electrical Conductivity of Rubber-Carbon Black Vulcanizates. B. B. S. T. Boonstra and Eli M. Dannenberg. *Industrial and Engineering Chemistry,* v. 46, Jan. 1954, p. 218-227.
Compares various types of carbon blacks as to resistivities they import to rubber stocks and changes in these resistivities with various parameters. Tables, graphs. 10 ref.

5713* Theoretical Design of the Rubber-Oil-Black Masterbatch. S. C. Einhorn and L. A. McLeod. *Institution of the Rubber Industry, Transactions,* v. 29, Dec. 1953, p. 281-286.
Classical stress-strain equation for rubber-like elasticity has been extended to apply to polymers which are optimally reinforced by carbon black and to stocks incorporating large quantities of non-polymeric extenders. Table, graph. 10 ref.

5714* White Factice in Cold Cured Rubber Proofings. A Laboratory Study. I. C. Falconer Flint and C. B. Featherstone. *Institution of the Rubber Industry, Transactions,* v. 29, Dec. 1953, p. 287-311.
Includes diagrams, photographs, tables, graphs.

5715* Acidic Constituents of Preserved Hevea Latex. M. Van Den Tempel. *Institution of the Rubber Industry, Transactions,* v. 29, Dec. 1953, p. 312-320.
Presents results of experimental studies. Tables, graph. 15 ref.

5716* GR-S Fractionation by Means of Selective Adsorption. M. A. Golub. *Journal of Polymer Science,* v. 11, Dec. 1953, p. 583-596.
Includes tables, graphs. 9 ref.

5717* Vulcanized Structures and Their Influence on Thermal Statbility and Fatigue of Rubber. (Russian.) B. A. Dogadkin and Z. N. Tarasova. *Kolloidnyi Zhurnal,* v. 15, no. 5, Sept.-Oct. 1953, p. 347-360.
Describes thermo-mechanical method based on relaxation of pressure of vulcanized rubbers in atmosphere of inert gas at various temperatures. Diagram, tables, graphs. 9 ref.

5718 Synthetic Rubber Protects the Navy's Propeller Shafts. E. A. Bukzin. *Mechanical Engineering,* v. 76, Jan. 1954, p. 17-20, 28.
Protection from corrosion provided by rubber and synthetic rubber is being recognized to a greater extent than ever before. Photographs.

5719 The Length of Molecular Chain of Cis-Polydiene and Trans-Polydiene. A. A. Chistorazum. *National Science Foundation Translation, no.* 61, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 999-1002.)
Cis-polyisoprene (natural rubber) was shown to have more valuable properties than *trans*-polyisoprene (gutta-percha) because the latter is crystalline. 5 ref.

5720 Silicone Elastomers. C. J. Baker. *Research,* v. 6, Dec. 1953, p. 458-464.
Development of cross-linked silicone polymers with rubber-like properties has provided a valuable new range of materials with unique electrical and mechanical properties at high and low temperatures. Graphs, photographs, table. 8 ref.

Rubber and Elastomers

5721* The Industrial Use of Softened Rubber. (French.) G. Giger. *Revue générale du caoutchouc*, v. 30, no. 12, Dec. 1953, p. 903-905.

Large scale experiments show that processing of a rubber which has been previously softened is considerably improved. Less time and energy are required for plasticizing. Tables. 4 ref.

5722 The Reinforcement of Butyl With Carbon Black. III. The Action of Promoting Agents. A. M. Gessler and F. P. Ford. *Rubber Age*, v. 74, Dec. 1953, p. 397-408.

Discusses compounding results obtained by heat treatment with S, Se, Te, and p-dinitroso benzene. Graphs, tables. 12 ref.

5723* Synthetic Rubber. V. The Neoprene Latices. Their General Characteristics Componding and Processing. W. G. Vennells. *Rubber Age and Synthetics*, v. 34, Dec. 1953, p. 433-435.

Discusses use and processing as adhesives and thread. Tables, graphs. 10 ref.

5724* Thermal Decomposition of Vulcanized Structures of Deformed Vulcanizates Containing Various Accelerators. D. Dogadkin and Z. Tarasova. *Rubber Chemistry and Technology*, v. 26, Oct.-Dec. 1953, p. 759-763. (Translated from *Doklady Akademii Nauk Soyuza Sovetskikh Sotsialsticheskikh Republik*, v. 85, no. 5, 1952, p. 1069-1072.)

Previously abstracted from original. See item 1656, v. 2, Feb. 1953.

5725* The Viscometric Detection of Branching in Polymers. I. Branching in GR-S as a Function of Conversion L. H. Cragg and A. T. Brown. *Rubber Chemistry and Technology*, v. 26, Oct.-Dec. 1953, p. 764-774.

There is little or no branching at low conversions but degree increases markedly with increasing conversion and to greatest degree in species of higher molecular weight. Tables, graphs. 18 ref.

5726* Structural Changes in Rubber Caused by the Action of Molecular Oxygen. V. Destructive Solution of Vulcanized Synthetic Rubbers. Z. Tarasova and B. Dogadkin. *Rubber Chemistry and Technology*, v. 26, Oct.-Dec. 1953, p. 787-797. (Translated from *Zhurnal Obshchei Khimii*, v. 22, 1952, p. 935-945.)

Describes experiments which show that destructive solution does not take place. Graphs, tables. 7 ref.

5727* Structure and Properties of Leaded Rubber Mixtures. IX. Modification of Carbon Structures by Repeated Deformations. X. Alternation of Carbon Black Structures by Heat Treatment. K. Pechkovskaya, Ts. Mil'man, and B. A. Dogadkin. *Rubber Chemistry and Technology*, v. 26, Oct.-Dec. 1953, p. 810-831. (Translated from *Kolloidnyi Zhurnal*, v. 14, no. 4, 1952, p. 250-259.)

Discusses problems connected with behavior of carbon black structures during mechanical treatment and relation of specific electric-resistivity of vulcanizates to temperature. Tables, graphs. 12 ref.

5728* Acrylic Elastomers. Preparation and Properties of Vulcanizable Acrylic Ester-Acrylonitrile Copolymers. E. M. Filachione, T. J. Fitzpatrick, C. E. Rehberg, C. F. Woodward, W. E. Palm, and J. E. Hansen. *Rubber Chemistry and Technology*, v. 26, Oct.-Dec. 1953, p. 843-857.

Preparation of Lactoprene-Bn, the butyl acrylate-acrylonitrile copolymer, as well as other acrylate-acrylonitrile copolymers and preliminary evaluation of heat stability and temperature of embrittlement of the vulcanizates. Tables, graph. 8 ref.

5729* Effect of Carbon Black on the Development of Oxidation Processes in Raw and Vulcanized Rubbers. A. S. Kuzminskii, L. I. Lyubchanskaya, N. G. Khitrova, and S. I. Bass. *Rubber Chemistry and Technology*, v. 26, Oct.-Dec. 1953, p. 858-861. (Translated from *Doklady Academii Nauk Soyuza Sovetskikh Sotsialisticheskikh Republik*, v. 85, no. 1, 1952, p. 131-133.

5730* The Resistance of Neoprene Products to Chemical Action. (German.) Erich Franke. *Werkstoffe und Korrosion*, v. 4, no. 11, Nov. 1953, p. 400-402.

Discusses behavior of neoprene when subjected to action of inorganic chemicals. Tables.

See also:

5568 (chemistry and dermatological aspects of synthetic rubbers)
5674 (crystallization phenomena in rubber)
5691 (modern production of rubber)
5695 (natural crystalline rubber)
5837 (latex in paper)

SPACE HEATING AND CONDITIONING

5731* Regeneration Device With Air Conditioning. (Russian.) N. A. Galochkin. *Bumazhnaia Promyshlennost*, v. 28, no. 10, Oct. 1953, p. 24-29.

Discusses more rational use of heat coming from drying part of the equipment. Diagrams.

5732* Efficiency in Domestic Heating. J. S. Hales. *Coke and Gas*, v. 15, Dec. 1953, p. 450-456.

Factors affecting efficient use of solid fuels in domestic heating appliances are considered. Diagrams, table, graphs, photographs.

5733 Residential Air Conditioning. E. P. Palmatier. *Heating and Ventilating*, v. 51, Jan. 1954, p. 67-70.

Method of estimating cooling loads is described. Operating costs in seven cities are analyzed. Tables, graph.

5734 Characteristics of Commercial Air Cleaners. Melvin W. First and Leslie Silverman. *Heating and Ventilating*, v. 51, Jan. 1954, p. 78-81.

Important features of commercial air cleaners in common use are grouped for easy comparison. Tables.

5735 Controlled Heating of Make-Up Air for Spray Booth at Hiller Helicopter Plant. Fred M. Burt. *Industrial Heating*, v. 20, Dec. 1953, p. 2460-2462, 2464, 2466-2468.

Describes provisions for input of properly heated air to compensate for spray booth exhausts. Photographs, diagrams.

5736* Alcoa's New Building Has Radiant Heating and Radiant Cooling. *Plant*, v. 9, Jan. 1954, p. 47-49.

Includes photographs, diagram.

5737 Operating Costs of the Air Cooled Residential Air Conditioner. J. D. Lovely. *Refrigerating Engineering*, v. 62, Jan. 1954, p. 35-37, 96.

Test data indicate that air cooled unit is cheaper to operate in almost any geographical location than a water cooled conditioning system. Photographs, graphs, diagram.

5738 Effect of Convection and Moisture Deposition on Heat Transmission Thru Cold Storage Test Walls. H. C. Brown, Jr. and L. E. Bish. *Refrigerating Engineering*, v. 62, Jan. 1954, p. 62-67; disc., p. 67, 90, 92, 94, 96.

Results of tests conducted in a dual temperature test building are discussed. Diagrams, photographs, graphs.

5739* A Rational Use of the Waste Heat of Intermittent Furnaces. (Russian.) B. N. Ol'shevskii. *Steklo i Keramika*, v. 10, no. 12, Dec. 1953, p. 16-18.

Describes a tubular recovery unit for complete utilization of heat. Diagrams.

5740* Radiant Heating. (French and German.) H. Weilmann. *Zeitschrift für Schweisstechnik*, v. 43, no. 12, Dec. 1953, p. 233-236.

Discusses principles of radiant heating. Describes installation and welding of pipes for radiant-heating systems. Photographs. (To be continued.)

5741 Trane Air Conditioning Manuel. 379 p. 1953. The Trane Co., La Crosse, Wisc. (TH7687 T68t3)

Application of fundamental facts of engineering to the design of air conditioning systems.

TEXTILES AND FIBERS

5742* Cotton and the Synthetic Fibers. George S. Buck, Jr. *American Association for Textile Technology, Papers,* v. 9, Dec. 1953, p. 9-16; disc., p. 17-18.

Discusses trends in textile treatment, research, and performance. Graphs, tables.

5743* The Development of a Pilling Test for Apparel Fabrics. Jack J. Press. *American Association for Textile Technology, Papers,* v. 9, Dec. 1953, p. 19-29; disc., p. 30-33.

Includes micrographs, graphs, tables.

5744* Tests for Colorfastness of Textiles Under Consideration in the International Organization for Standarization. William D. Appel. *American Dyestuff Reporter,* v. 42, Dec. 21, 1953, p. P871-P887.

Includes tables, diagrams.

5745* The Effects of Urea-Formaldehyde Resins on the Light Fastness of Direct Dyes. Kenneth J. Broden, chairman. *American Dyestuff Reporter,* v. 43, Jan. 4, 1954, p. P6-P13.

Includes tables. 15 ref.

5746* Measurements of Orientation in Cotton Fibres Using Polarized Light. R. Meredith. *British Journal of Applied Physics,* v. 4, Dec. 1953, p. 369-373.

Variation in calculated spiral angle of fibrils is closely related to convolution angle. Data suggests that overage spiral angle in original unconvoluted fibers may be the same for all varieties. Photomicrographs, table, diagram, graphs. 10 ref.

5747* Improvement of Cellulose by Fiber Fractionating. (Russian.) S. L. Talmud, A. M. Ivaniushkina, L. A. Popova, and L. P. Ianzuveva. *Doklady Akademii Nauk SSSR,* v. 92, no. 2, Sept. 11, 1953, p. 397-398.

Compares strength of washed and unwashed fibers. Tables. 4 ref.

5748* Cotton and Wool Textiles—Case Studies in Industrial Migration. James A. Morris. *Journal of Industrial Economics,* v. 11, no. 1, Nov. 1953, p. 65-83.

Discusses migration trend in cotton textile industry from New England to the southeast and rapid growth of wool manufacturing facilities in the southeast.

5749* Deterioration of Cuprammonium-Proofed Jute Fabric. W. G. MacMillan, S. N. Basu, and P. N. Pal. *Journal of Scientific & Industrial Research,* v. 12, sec. B, 1953, p. 558-562.

Natural deterioration of cuprammonium-proofed jute farbic has been found to be mainly due to liberation of acid, presumably from ammonium sulphate deposited as byproduct. Addition of sodium carbonate, in suitable amounts, to usual formula counteracts this effect. Tables. 6 ref.

5750* Courtaulds Gives AATT Facts on Spun-Dyed Rayon Staple. C. P. Tattersfield. *Modern Textiles Magazine,* v. 34, Dec. 1953, p. 32-33, 51-52.

Describes fastness properties of Coloray rayon staple fiber and processing methods. Graphs, diagram.

5751* Quality Control Through Statistical Methods. III. What Is Wrong With "Maximum Variation"? Norbert Lloyd Enrick. *Modern Textiles Magazine,* v. 34, Dec. 1953, p. 79-82.

Discusses limitations of maximum range method for measuring variations of yarn. Tables, diagram, graph.

5752* Tufton. Rayon's Newest Carpet Yarn. Joseph W. Schappell. *Modern Textiles Magazine,* v. 34, Dec. 1953, p. 31, 87-88.

Superiority of Tufton over regular carpet rayon with respect to soilability is discussed. Diagrams, micrographs.

5753* Emsley Lecture. Some Aspects of Textile Development as Seen From Switzerland. E. Honegger. *Textile Institute, Journal, Proceedings and Standardization,* v. 44, Dec. 1953, p. P785-P793.

Loom development and ring-spinning frame among Swiss latest developments.

5754* The Heat of Wetting of Fibres. N. F. N. Bright, T. Carson, and G. M. Duff. *Textile Institute, Journal, Transactions,* v. 44, Dec. 1953, p. T587-T595.

Measurements have been made of total heats of wetting wool; Ardil; natural and regenerated silk; drawn and undrawn nylon and Terylene; drawn continuous filament Orlon; and also of partial heats of wetting of wool and Ardil. Tables, graphs, diagram. 13 ref.

5755* The Structure of Flax Fibre Strands. D. R. Gilling and D. E. J. Samuels. *Textile Institute, Journal, Transactions,* v. 44, Dec. 1953, p. T609-T618.

Investigations are described demonstrating presence of a succession of longitudinal fissures in strands of hackled retted flax fiber, attributable to a disruption of binding materials between ultimate fibers. Graphs, tables, micrographs.

5756* The Physical Properties of Felt. I. Felt Structure, Extension and Recovery. A. Baines. *Textile Institute, Journal, Transactions,* v. 44, Dec. 1953, p. T645-T656.

Experimental determination of this relationship for both wool fibers and wool felt is described. Data are shown to have the form predicted by structural unit theory. Graphs, table, diagrams. 8 ref.

5757* "S Factor," A Microbial Enzyme Which Increases the Swelling of Cotton in Alkali. P. B. Marsh, K. Bollenbacher, M. L. Butler, and L. R. Guthrie. *Textile Research Journal,* v. 23, Dec. 1953, p. 787-888.

Includes diagram, tables, graphs. 23 ref.

5758* Hemicellulose in the Viscose Rayon Process. A Chromatographic Investigation. A. Buurman. *Textile Research Journal,* v. 23, Dec. 1953, p. 888-896.

Includes diagram, chromatograms, graphs, tables.

5759* Use of the Ballistic Pendulum for Impact Testing of Tirecord. W. James Lyons and Irven B. Prettyman. *Textile Research Journal,* v. 23, Dec. 1953, p. 917-925.

Reviews pendulum theory. Describes construction and operation of test apparatus. Diagrams, tables, graphs. 8 ref.

5760* Polymerization of *beta*-Propiolacetone in Wool. W. Gordon Rose and Harold P. Lundgren. *Textile Research Journal,* v. 23, Dec. 1953, p. 930-936.

Reaction of propiolacetone with wool was studied with the purpose of increasing rate of reaction within the fiber, while still retaining enhanced felting qualities of the modified wool. Graphs. 7 ref.

5761* Dyeing of Poly-Amide Fiber With Acid Dyes. (Russian.) E. K. Mankash and A. B. Pakshver. *Zhurnal Prikladnoi Khimii,* v. 26, no. 9, Sept. 1953, p. 976-981.

Discusses dependence of internal diffusion on conditions of preliminary treatment, stretching, and dyeing temperature. Tables. 5 ref.

See also:
4427 (asbestos textiles)

THERMODYNAMICS

5762* The Contribution of Radiation to the Conduction of Heat. II. Boundary Conditions. E. F. van der Held. *Applied Scientific Research,* v. 4, sec. A, no. 2, 1953, p. 77-99.

A mathematical analysis of steady state heat flow. Graphs, tables.

5763 Natural-Convection Heat Transfer at Reduced Pressure. J. R. Kyte, A. J. Madden, and Edgar L. Piret. *Chemical Engineering Progress,* v. 49, Dec. 1953, p. 653-662.

Heat-transfer rates in natural convection from spheres and wires to several gases at reduced pressures are measured. New geneararized heat-transfer equations covering an extremely wide range of conditions are presented. Diagrams, photographs, graphs, tables. 19 ref.

5764* Transversely Coupled Heat Exchangers. (German.) F. Bosnjakovic. *Chemie-Ingenieur-Technik,* v. 25, no. 11, Nov. 1953, p. 651-664.

Thermal efficiency was investigated in respect to dependence

Thermodynamics

upon type of coupling, efficiency of individual elements, and ratio of heat quantities to be exchanged. Graphs, diagrams.

5765* Analysis of the Influence of the Physical Properties of an Active Body on the Magnitude of Irreversible Losses of Return Circulatory Processes. (Russian.) L. M. Rozenfel'd and R. N. Mikhal'skaia. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 269-272.

Presents an analysis of physical properties of vapors of boiling liquids. Tables, graphs. 9 ref.

5766* The Law of Similarity in the Thermodynamic Properties of Solutions. (Russian.) B. V. Deriagin and M. I. Shakhparonov. *Doklady Akademii Nauk SSSR*, v. 93, no. 3, Nov. 21, 1953, p. 515-517.

Similarity depends on form and concentration of molecular dimensions of components. 3 ref.

5767 The Statistical Mechanics of Systems With Non-Central Force Fields. J. A. Pople. *Faraday Society, Discussions*, no. 15, 1953, p. 35-43.

General method for investigating thermodynamic effects of dependence of intermolecular potential on orientation is described. Tables. 31 ref.

5768 Statistical Thermodynamics of Solutions of Molecules With Spherical Field of Forces. I. Prigogine and A. Bellemans. *Faraday Society, Discussions*, no. 15, 1953, p. 80-93.

Considers case of molecules with slightly different radii. Graphs, tables. 19 ref.

5769 Theoretical Aspects of the Effect of Pressure on Gas + Condensed Phase Equilibria. T. J. Webster. *Faraday Society, Discussions*, no. 15, 1953, p. 243-252.

A summary of experimental results is included. Tables. 20 ref.

5770 The Push to Hotter Temperatures. *Fortune*, v. 49, Jan. 1954, p. 114-119, 124, 126, 128-129.

Discusses increase in temperatures employed and encountered in industrial technology. Photographs, diagrams, graphs.

5771 Some Thermodynamic Properties of Nitric Oxide. J. B. Opfell, W. G. Schlinger, and B. H. Sage. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 189-194.

Includes graphs, tables. 11 ref.

5772 Thermodynamic Correlation of Vapor-Liquid Equilibria. Bernard S. Edwards, Frank Hashmall, Roger Gilmont, and Donald F. Othmer. *Industrial and Engineering Chemistry*, v. 46, Jan. 1954, p. 194-199.

A new method of predicting equilibrium conditions of multicomponent systems from binary data has been developed. Graph, tables, phase diagrams. 22 ref.

5773* Adsorption Studies on Metals. II. Absolute Entropies of Absorbed Molecules on Molybdenum. J. J. Chessick, F. H. Healey, and A. C. Zettlemoyer. *Journal of Physical Chemistry*, v. 57, Dec. 1953, p. 912-915.

Presents results of experimental studies. Graphs. 12 ref.

5774 Viscous Oil Heat Exchangers. Abe Devore and Joseph E. Heinz. *Petroleum Refiner*, v. 32, Dec. 1953, p. 105-110.

Methods and examples are given for viscous flow in flow inside tubes; unbaffled flow outside a bare tube bundle; and outside a longitudinally finned tube bundle. Graphs, tables. 8 ref.

5775 Determination of Thermodynamic Temperatures Near 0°K Without Introducing Heat Below 1°K. W. F. Giauque. *Physical Review*, v. 92, ser. 2, Dec. 15, 1954, p. 1339-1345.

Methods of introducing heat in the region of temperature and magnetic field accessible below 1 K are compared. Experimental limitations are pointed out. 22 ref.

5776 The Magnetic Properties of an Electronic Einstein Model Solid. M. F. M. Osborne and M. C. Steele. *Physical Review*, v. 92, ser. 2, Dec. 15, 1953, p. 1403-1419.

Model gives a satisfactory description of thermodynamic properties of superconductors and of paramagnetic salts. Graphs. tables, diagrams. 16 ref.

5777* A Note on Uniqueness Proofs for Boundary-Value Problems in Potential Theory and Steady Heat Conduction. M. E. Rayner. *Quarterly Journal of Mechanics and Applied Mathematics*, v. 6, Dec. 1953, p. 385-390.

If the boundary tends to infinity in two directions, additional information to prove uniqueness can be found.

See also:
4515 (applied thermodynamics in chemical engineering)
5181 (application of thermodynamic functions to metallurgy)

WELDING AND JOINING

5778* Sheet-Metal Welding. III. Application of the Pantograph Principle to the Argon-Arc Welding of Gas-Turbine Assemblies. *Aircraft Production*, v. 15, Dec. 1953, p. 470-477.

Includes photographs, diagrams.

5779* Brazing of Metals. (Hungarian.) István Varga. *Aluminium (Budapest)*, v. 5, no. 10, Oct. 1953, p. 222-224.

Reviews advantages, general principles, and various processes. Diagrams, photographs, table.

5780* Brazing of Metals. (Hungarian.) István Varga. *Aluminium (Budapest)*, v. 5, no. 12, Dec. 1953, p. 251-258.

Discusses properties of various brazing metals. Adaptability of these metals to joining various materials is outlined. Correct design of joints is described. Tables, diagrams, graphs. 14 ref.

5781* Mechanical Testing and Inspection of Structural Adhesives. H. Grinsfelder, B. Coe, and R. P. Hopkins. *ASTM Bulletin*, 1953, no. 194, p. 62-66.

Presents factors involved in evaluating potential structural adhesives, including specific data for adhesives tested on polymethacrylate adherends. Suggests new approach to problem of minimizing destructive testing in inspection procedures on bonded assemblies. Tables, graph. 8 ref.

5782* Welding Problems in the Construction of a Modern Boiler Plant. F. L. Dingle. *Australasian Engineer*, 1953, Nov., p. 46-51.

Paper from Welding Engineering Symposium, Sydney, Nov. 1953. High pressure and temperature considerations in steam generator construction are discussed. Photographs, diagrams.

5783* Metallurgical Aspects of Chain Manufacture. J. Waring. *Australasian Engineer*, 1953, Nov., p. 52-58.

Metallurgical problems in manufacture of short-link pitched, calibrated, and stud link chains. Graphs, photographs, micrographs, diagram, tables. 27 ref.

5784 Automatic Welding Lines for Fisher Body Components. Thomas MacNew. *Automotive Industries*, v. 110, Jan. 1, 1954, p. 56-59.

Presents progress made by one of todays largest users of welding automation. Photographs, diagram.

5785 Flux Backings in the Submerged Arc Welding of Vessels. I. N. Gerasimenko. *Henry Brutcher, Altadena, Cal., Translation no.* 2999, 3 p. (From *Avtogennoe Delo*, v. 20, no. 5, 1949, p. 16-17.)

Discusses importance of correct flux selection and densification. Describes problem of welding the inner seams of circular-section vessels on flux backing. Table, diagrams, photograph.

5786 Development of Primary Structures of Welds in Low Carbon and Low Alloy Steels by Electrolytic Etching. A. A. Rossoshinskii. *Henry Brutcher, Atladena, Cal., Translation no.* 3071, 5 p. (From *Avtomaticheskaya Svarka*, v. 6, no. 1, 1953, p. 52-54.)

Describes principle underlying development of primary structures by metallographic techniques. Discusses shortcomings of deep etching and of multiple etching as applied to development of primary structure. Diagram, micrographs. 9 ref.

5787 Inert Gas Welding Applied to Pipe and Tubing. R. E. Lorentz, Jr. *Combustion*, v. 25, Dec. 1953, p. 41-45.

Article gives general information concerning one of the newer welding processes as used in welding of pipe and tubing.

Inert-gas welding processes are widely used in many more applications than specific ones discussed here. Photographs.

5788* Modern Welding Technique. XX. Miscellaneous Non-Ferrous Alloys. XXI. The Metallurgy of Steel Welding. E. T. Gill and Eric N. Simons. *Edgar Allen News*, v. 32, Dec. 1953, p. 273-274.

Describes preparation of surfaces, techniques of resistance welding, and repair of castings for Mg and its alloys. Presents general remarks regarding welding of steel. (To be continued.)

5789* How to Use Hot Pressure Welding. *Industry & Welding*, v. 27, Jan. 1954, p. 50-52, 55-57.

Includes photographs.

5790 Induction Heater Boosts Output of Brazed and Soldered Parts. O. W. Noeske and W. F. Sickels. *Iron Age*, v. 173, Jan. 14, 1954, p. 116-117.

Induction heating for soft soldering and Ag brazing five joints of a thermostatic diaphragm has cut costs, increased production, and reduced rejects. Diagram, photograph.

5791* Welding Aluminum Sheet. *Linde Tips*, v. 33, Jan. 1954, p. 5-9.

Discusses preparations for welding, preheat temperatures, and control of weld puddles. Photographs, diagrams.

5792 Weldability of Steel as It Is Considered by Swiss Engineers. Charles G. Keel. *Metal Progress*, v. 65, Jan. 1954, p. 89-93.

Swiss specifications dealing with electrodes and weldable steels for penstocks, bridges, sluice gates, and other massive objects working under high stresses. Photographs, tables.

5793* The Determination of Droplet Size in Arc Welding my High-Speed Cinematography. P. D. van der Willigen and L. F. Defize. *Philips Technical Review*, v. 15, Oct. 1953, p. 122-128.

Films have been made of transfer of weld metal, with a camera taking up to 3000 frames per sec. Graph, diagrams, photographs, tables.

5794 Ways to Attach Small Die Cast Parts. Hiram K. Barton. *Product Engineering*, v. 25, Jan. 1954, p. 198-202.

Consists of diagrams and explanations.

5795* Calculation of Welded Design for Static Load. (German.) K. H. Effertz. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 394-400.

Outlines mathematics for welded parts subjected to various types of static stresses. Graph, table, diagrams. 8 ref.

5796* Calculation of Welded Joints for Variable Stress. (German.) A. Erker. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 400-417.

Discusses change of stress with time; notch effects; calculation of fatigue strength; effect of irregular stresses; permissible stress and safety factors; butt-, spot-, seam-, and fusion-welding; strap joints; and details of weld design. Tables, diagrams, graphs, photographs. 54 ref.

5797* Mutual Effect Between Welding Process and Weld. (German.) Walter Schulze. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 417-423.

Principles of different welding methods and various types of joints and seams are discussed. Tables, graphs, diagrams.

5798* Welded Corner Joints in Machine-Construction. (German.) Walter Schulze. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 424-427.

Shows that type and magnitude of stress, welding method, and economic factors must be considered in design of welded corner joints. Diagrams, graphs.

5799* Welded Flanges, Reinforcements, and Nozzles. (German.) E. Wiese. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 427-429.

Different methods of attaching nipples and other structural parts to heavy steel plate are discussed. Diagrams.

5800* Pipe Joints in Structural Steelwork. (German.) H. Böhden and A. Köhler. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 429-432.

Different methods of joining pipe of different and equal diameters are discussed. Diagrams. 2 ref.

5801* Welded Pipe-Joints. (German.) H. Jansen. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 432-435.

Design of different joints is discussed. Photographs diagrams, graph. 4 ref.

5802* Design of Hinged Connections for Structural Members. (German.) H. Heitzer. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 436-440.

Numerous designs of mono- and multi-lateral hinge fittings are described. Diagrams.

5803* Welded Corners of Frames. (German.) H. Schulz and K. H. Kenn. *Schrweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 441-445.

Numerous intricate designs are discussed. Diagrams.

5804* Joints at Right Angles in Welded Constructions. (German.) H. Kriesche. *Schweissen und Schneiden*, v. 5, no. 11, Nov. 1953, p. 445-455.

Numerous methods of joining sheet metal and structural steel at 90° angles are discussed.

5805* Correct Welding Procedure. V. Lester F. Spencer. *Sheet Metal Worker*, v. 45, Dec. 1953, p. 62-64.

Welding of Al base alloys, by carbon arc, atomic hydrogen, and resistance methods. Tables. (To be continued.)

5806* Techniques of Repairing Hydraulic Turbines by Welding and Associated Processes at the Electricité de France. (French.) J. Narcy and R. Kermabon. *Soudure et Techniques connexes*, v. 7, nos. 11-12, Nov.-Dec. 1953, p. 265-278; disc., p. 278-281.

Discusses repairing techniques depending on type of wheel, wear characteristics, and chemical composition of metal. Operating methods and chemical composition of electrodes used are described. Photographs, tables.

5807* Definition of Fatigue Resistance in the Case of Steel-Welded Structures. (French.) *Soudure et Techniques connexes*, v. 7, nos. 11-12, Nov.-Dec. 1953, p. 282-284.

Presents results of tests conducted by International Welding Institute's Fatigue Testing Commission no. 13. Photographs.

5808* Rate of Fusion of Arc-Welding Electrodes. (French.) J. ter Berg and A. Larigaldie. *Soudure et Techniques connexes*, v. 7, nos. 11-12, Nov.-Dec. 1953, p. 285-290; disc., p. 290.

Outlines various factors influencing specific rate of fusion of electrodes by arc welding. Discusses chemical composition of coatings. Graphs, diagrams, table, photographs. 7 ref.

5809* Glues and Gluing. XXVII. John E. Hyler. *Southern Lumberman*, v. 188, Jan. 1, 1954, p. 41-42, 44-46.

Essential procedures in handling and manufacturing glue. Photographs.

5810* Multi-Electrode Automatic Welding and Building Up Under a Flux. (Russian.) N. P. Emel'ianov, A. V. Obukhov, and D. A. Dul'chevskii. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 73-78.

Describes increased productivity of method. Diagrams, photographs, tables.

5811* Pipe-Welding Tool for Production of Electric Welded Pipe. (Russian.) M. E. Katsnel'son. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 78-81.

Discusses manufacture of pipes from hot or cold rolled steel strip. Describes operation of the welder. Diagram, table, graph.

5812* Cold Welding of Aluminum. (Russian.) I. B. Baranov. *Vestnik Mashinostroeniia*, v. 33, no. 9, Sept. 1953, p. 86-89.

High productivity and simplicity permits joining of different metals. Diagrams, graphs, photographs, table.

Welding and Joining

5813 Refrigerator Plant of Tomorrow. Clyde B. Clason. *Welding Engineer,* v. 39, Jan. 1954, p. 28-31.

Describes new ideas, layout, techniques, skills, and many new production welding tools. Photographs.

5814 Weldability of Structural Steel. E. L. Erickson. *Welding Journal,* v. 32, Dec. 1953, p. 1155-1159.

Requirements and development of steels for ships, buildings, and bridges from standpoint of government specifications and use. Tables.

5815 Tension, Shear and Impact Strengths of Spot-Welded Titanium Joints. M. L. Begeman, E. H. Block, Jr., and Frank W. McBee, Jr. *Welding Journal,* v. 32, Dec. 1953, p. 599S-604S.

Physical properties necessary for design of spot welded joints in commercially pure Ti sheet were determined. Tables, photograph, graphs. 13 ref.

5816 Effect of Nitrogen and Carbon Dioxide Atmospheres on Arc Welding. F. W. Sowa, W. C. Truckenmiller, and L. E. Wagner. *Welding Journal,* v. 32, Dec. 1953, p. 619S-624S.

Effect of surrounding atmosphere on formation, precipitation and distribution of oxide and nitride constituents was studied. Tables, photographs, micrographs.

5817 Welding in the Atomic Energy Projects. I. H. Hogg. *Welding and Metal Fabrication,* v. 22, Jan. 1954, p. 2-14.

A complete discussion of welding process that is used at a plant in Canada. Photographs, tables, diagrams.

5818 Structures for Atomic Defense. *Welding and Metal Fabrication,* v. 22, Jan. 1954, p. 22-27.

Discusses welding used in construction of equipment for atomic apparatus. Photographs.

5819 Aspects of Welding Research in British Merchant Shipbuilding. R. B. Shepheard. *Welding and Metal Fabrication,* v. 22, Jan. 1954, p. 28-32.

Welding research affecting shipbuilding undertaken in Great Britain during recent years is discussed. Diagrams, photographs. 19 ref.

Books and Miscellaneous Publications

5820 Adhesives for Wood. R. A. G. Knight. **Royal Aeronautical Society Monographs on Metallic and Other Materials.** v. III. 242 p. 1952. Chapman and Hall Ltd., London W.C.2. (TP968 K74a)

Deals with a particular aspect of the age-old problem of how to join components together. In this case, components are of wood in one of its many forms. In addition, joining of wood to metals and plastics has to be considered.

See also:
5590 (prevention of welding fires)
5740 (welding of pipes for radiant heating systems)
5843 (gluing of plywood)

WOOD AND FOREST PRODUCTS

5821 Chemical Dissociation of Fir Wood Pulp During Sulfite Digestions. (Russian.) L. P. Zherebov. *Bumazhnaia Promyshlennost,* v. 28, no. 9, Sept. 1953, p. 6-14.

Discusses differences in chemical composition of wood produced in summer months from that produced in winter months. Tables, micrographs. 12 ref. (To be continued.)

5822* Delignification of Wood Pulp by Ethylene Glycol. (Russian.) A. A. Konkin and Z. A. Rogovin. *Bumazhnaia Promyshlennost,* v. 28, no. 9, Sept. 1953, p. 15-19.

Describes results of process and properties of cellulose and lignin obtained. Tables, graph. 7 ref.

5823 Bleaching of Wood Pulp by Sodium Bisulfite. (Russian.) D. E. Strazds. *Bumazhnaia Promyshlennost,* v. 28, no. 9, Sept. 1953, p. 29-30.

Production of high quality paper made possible by whiteness of wood pulp. Diagram.

5824* Influence of Molecular Heterogeneity of Viscous Sulfite Cellulose on Its Reactive Capacity. (Russian.) L. E. Akim and V. E. Kil'kki. *Bumazhnaia Promyshlennost,* v. 28, no. 10, Oct. 1953, p. 5-9.

It was found that good reaction capacity was observed with mixtures containing small amount of low molecular fractions and complete absence of very highly polymerized fractions. Tables.

5825* Automatic Grinding of Wood Pulp in Rollers. (Russian.) M. P. Bondar and N. M. Ianishevskii. *Bumazhnaia Promyshlennost,* v. 28, no. 10, Oct. 1953, p. 9-13.

Describes operation of various grinders. Graphs, diagrams.

5826* Highly Transparent Paper. (Russian.) D. M. Fliate. *Bumazhnaia Promyshlennost,* v. 28, no. 10, Oct. 1953, p. 14-19.

Discusses fundamental conditions of production. Microphotographs, tables, diagrams. 12 ref.

5827* Continuous Calendering of Cardboard Sheets on Coupled Calenders. (Russian.) I. S. Seleznev. *Bumazhnaia Promyshlennost,* v. 28, no. 10, Oct. 1953, p. 29-30.

New method with automatic turning of sheets is presented. Diagram.

5828* Digesting of Birch Wood Pulp by the Sulfate Method. (Russian.) I. S. Khutorshchikov. *Bumazhnaia Promyshlennost,* v. 28, no. 12, Dec. 1953, p. 22-25.

Discusses possibility of digesting birch pulp either in a homogenous form or in mixtures with other deciduous or coniferous woods. Describes mechanical properties of paper made from birch pulp. Tables.

5829* Application of Plywood Pipes in Cellulose-Paper Industry. (Russian.) A. A. Kireev. *Bumazhnaia Promyshlennost,* v. 28, no. 12, Dec. 1953, p. 25.

Discusses properties of plywood pipes. Application decreases maintenance costs and saves valuable metal.

5830 Paper Production on the Upswing. Robert B. Hobbs and William K. Wilson. *Chemical and Engineering News,* v. 32, Jan. 4, 1954, p. 40-42.

Increase of 30% in semi-chemical pulping points to importance of this process in paper manufacture. Graphs, table.

5831 The Chemistry of Wood Extractives. F. E. King. *Chemistry & Industry,* 1953, no. 50, Dec. 12, p. 1325-1328.

Includes table. 27 ref.

5832* The Laboratory Control of Pulp and Paper Manufacture. Julius Grant. *Laboratory Practice,* v. 2, Dec. 1953, p. 643-648.

Includes graphs, photographs, diagrams. (To be continued.) 4 ref.

5833* Polyethylene Coating on Paper. II. C. W. Patton. *Paper, Film and Foil Converter,* v. 28, Jan. 1954, p. 23-26.

Presents some elementary factors involved, including description of extruder and its operating conditions; extrusion-lamination of high concentration polyethylene-wax blends; and applications. Diagrams, photographs, tables.

5834* Camp's New Bleach Plant in Operation. *Paper Mill News,* v. 76, Dec. 26, 1953, p. 8-12, 14, 29.

Describes pulp mill equipment, plant layout, and operating procedures. Photographs.

5835* How to Screen Sulphite Pulp. Gustaf Ranhagen. *Paper Trade Journal,* v. 138, Jan. 1, 1954, p. 12-14, 16, 18-20, 22.

Discusses theory, equipment, and practices in Sweden. Table, diagrams, photographs, micrographs.

5836* Finishing Methods for Pinewood. H. Courtney Bryson. *Product Finishing,* v. 6, Dec. 1953, p. 61-71, 120.

Observations on seasoning, preservation, and painting of wood. Photographs.

5837 Latex in Paper. W. H. Stevens. *Rubber Developments,* v. 6, Winter 1953, p. 102-111.

Reviews past experience. Indicates direction in which further

investigations might be expected to be fruitful. Photographs. 18 ref.

5838* Looking Ahead. Nelson C. Brown. *Southern Lumberman,* v. 187, Dec. 15, 1953, p. 101-105.

Discusses trends in reforestation, controls, production, and future markets for forest products. Photographs.

5839* Why Waste Wood? Milton Applefield. *Southern Lumberman,* v. 187, Dec. 15, 1953, p. 141-146.

Economic advantages and methods of utilizing wood waste. Photographs.

5840* Warping and Discoloring. Harry D. Tiemann. *Southern Lumberman,* v. 187, Dec. 15, 1953, p. 158-161.

Behavior of lumber during kiln-drying is discussed. Diagrams, photographs.

5841* Trends in Southern Hardwood Forestry. E. L. Demmon. *Southern Lumberman,* v. 187, Dec. 15, 1953, p. 174-177.

Possibilities of increased utilization of hardwood products is discussed. Tables, photographs.

5842* Corrugated Plywood. Thomas D. Perry. *Southern Lumberman,* v. 187, Dec. 15, 1953, p. 191-195.

Describes production and uses in Brazil. Photographs, diagram.

5843* Glue and Gluing. XXVI. John E. Hyler. *Southern Lumberman,* v. 187, Dec. 15, 1953, p. 247-248, 250, 252.

Compares various glues and their use in plywoods. Photographs.

5844* Semichemical and High-Yield Chemical Pulping of Hardwoods With Sodium Sulphite and Sodium Bisulphite. R. M. Husband. *Tappi,* v. 36, Dec. 1953, p. 529-534.

Includes tables, graphs. 19 ref.

5845* Hemicelluloses and Arabogalactans as Beater Adhesives. James O. Thompson, John W. Swanson, and Louis E. Wise. *Tappi,* v. 36, Dec. 1953, p. 534-541.

Discusses factors influencing effectiveness. Tables, graph. 27 ref.

5846* A Comparison of Kraft and Neutral Sulphite Semichemical Pulps From Birch and Maple. D. J. MacLaurin, J. R. Peckham, and W. B. Weber. *Tappi,* v. 36, Dec. 1953, p. 553-557.

Raw materials and pulping and bleaching procedures are discussed. Presents evaluation of pulps. Tables, graphs.

Books and Miscellaneous Publications

5847 Mechanical Properties of Wood and Paper. W. W. Barkas, R. F. S. Hearmon, and H. F. Rance. 298 p. 1953. Interscience Publishers, Inc., New York. (TS1176 B24m)

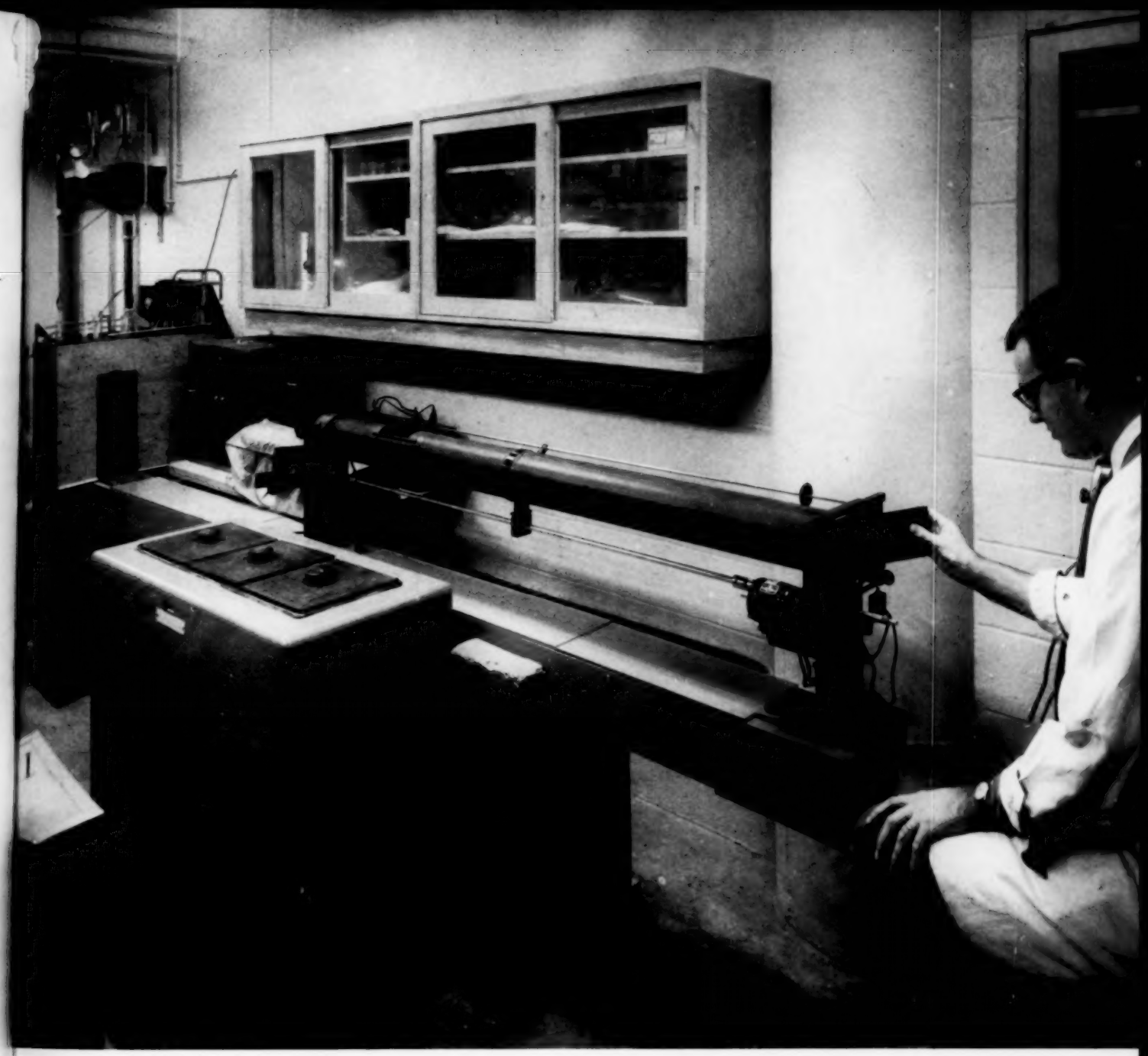
Contains chapters on elastic and plastic properties; hygroscopicity, swelling, and shrinking; osmotic pressure and swelling stresses; plastic swelling and sorption hysteresis; papermaking process from a rheological standpoint; conventional and arbitrary mechanical testing of paper; hygrosensitivity of paper in relation to its rheology; tensile studies on paper; interpretation and effect of structure on rheological behavior; analogies with the behavior of other materials; compressibility, softness, and folding endurance; instrumentation; and some practical applications and practical considerations.

5848 Wood Preservation. American Forestry Series. George M. Hunt and George A. Garratt. 2nd Ed. 415 p. 1953. McGraw-Hill, New York. (TA422 H91w2)

Edition is intended to serve both as a text for students in forestry and engineering; a reference volume for those engaged in the wood-preserving industry; for purchasing agents and engineers concerned with use of wood; and for others interested in development and promotion of new materials and methods of treatment.

See also:

4491 (filtering of wood pulp)
4499 (cooling tower wood maintenance)
4613 (recovery of soluble wood products)
4977 (insect proofing of paper)
5004 (carbonization of wood)
5128 (design of paper making machines)
5589 (research in paper industry)
5680 (use of plastics in pulp mills)
5820 (bonding of wood)



MEASURING MATERIALS IN SOLUTION

The electrophoresis apparatus is useful for identifying and isolating components of a solution or suspension. It is thus used for the analysis of serums and other suspended protein materials. It can electrically separate and measure the mobility, relative concentration, and homogeneity of any type of material that will carry an electrical charge and remain suspended in solution. Materials to be measured are placed in a U-shaped cell in the tank between the source light on the far left of the photo and the long tubular camera. When an electrical current is applied to electrodes placed in each stem of the cell, the suspended particles move toward the electrodes. It is in this movement that properties are measured. The camera can record the movement through a porthole.

BATTELLE INSTITUTE was founded by the will of Gordon Battelle as a memorial to the Battelle family. The Battelles were among the first settlers of Ohio and were prominent in the development of the state's iron and steel industry.

Gordon Battelle, last of the family line, was impressed with the benefits to be derived from industrial research and left his estate for the building and endowment of an Institute "for the purpose of education . . . the encouragement of research . . . and the making of discoveries and inventions for industry." The Institute began operations in 1929.

As established, Battelle provides, on a not-for-profit basis, the physical plant, equipment, and personnel for conducting research. The great bulk of it is applied research conducted for industry and government.

In keeping with its educational function, the Institute also conducts fundamental or basic research. The results of much of this research are published for the general encouragement of science and industry, and to benefit the public welfare.

Fields of research at Battelle include agriculture and practically all the industrial and engineering sciences.

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